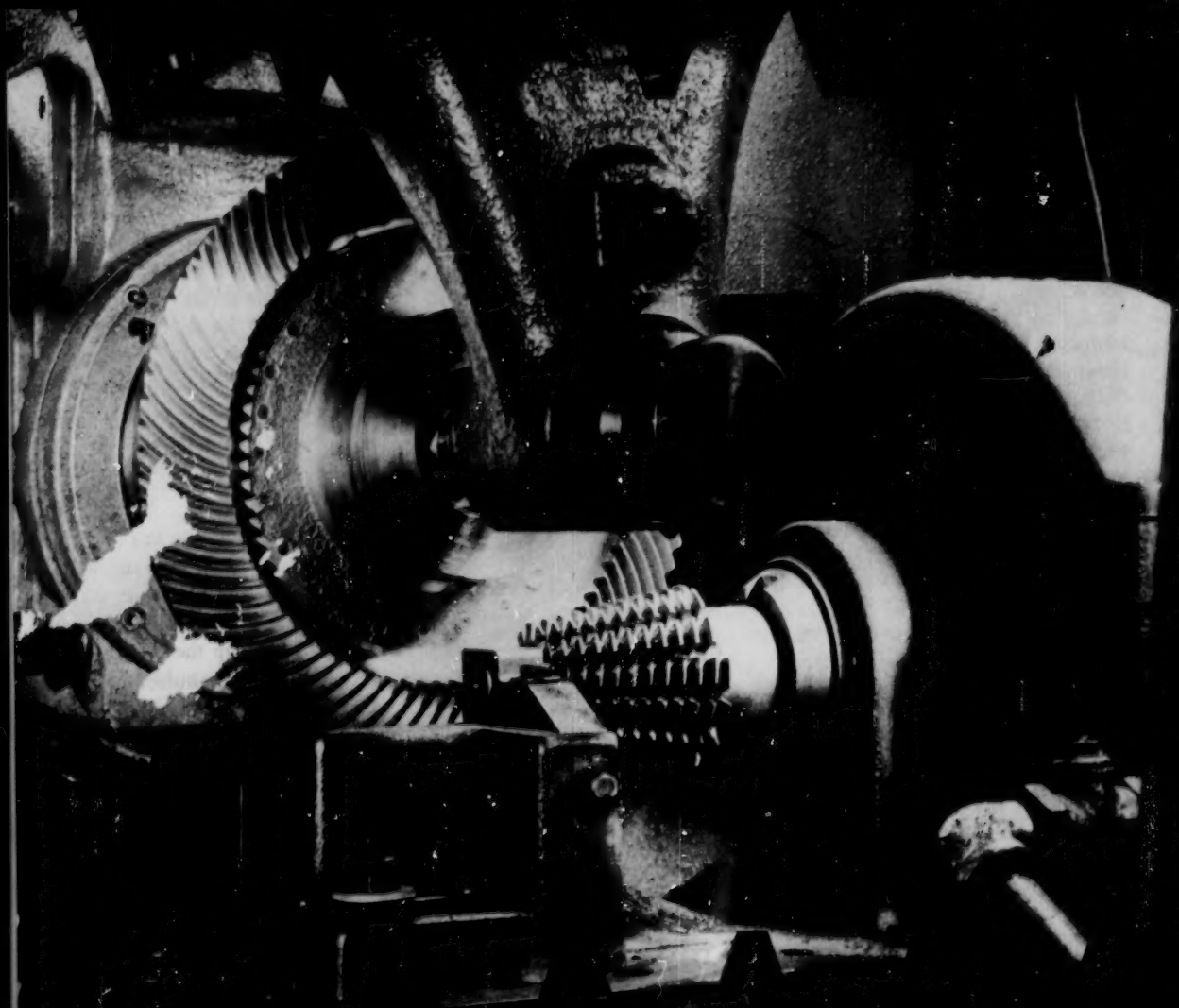
THE MAGAZINE OF

Standards



Standards for Instrument Gearing

August 1956

THE MAGAZINE OF

Standards

August, 1956 Volume 27, No. 8

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Published monthly by the
American Standards Association, Incorporated
70 East Forty-fifth Street, New York 17, N. Y.

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Single copy 60¢. $7.00 per year (foreign $8.00). Schools and libraries $5.00 (foreign $6.00). This publication is indexed in the Engineering Index and the Industrial Arts Index. Re-entered as second class matter Jan. 25, 1954, at the Post Office, New York, N. Y., under the Act of March 3, 1879.
Opinions expressed by authors in THE MAGAZINE OF STANDARDS *are not necessarily those of the American Standards Association.*

Marginal Notes

A Precocious College Student—

The picture of Sir William Perkin (front cover, July issue), which shows him as he looked in his later years, has aroused some comment. Actually, Perkin was a boy of 18 when he discovered the synthetic dye that made him famous. He was a student at the Royal College of Chemistry, studying under the famous professor and pioneer in organic chemistry, August William von Hofmann. As a teacher, von Hofmann was noted for his insistence on experimental demonstrations. He himself had developed a method of preparing aniline from benzene. His investigations on coloring matter led, in 1887, to his discovery of "quinoline red."

Perkin's discovery of the bluish substance that had excellent dyeing properties, later named "mauve," took place in 1856. He made the discovery in his rough home laboratory where, in addition to his studies at the college, he spent his evenings carrying out his own investigations. He recognized the commercial possibilities and the importance of his discovery, and immediately took out a patent for the process of making the synthetic dye.

Perkin lost no time in putting his discovery to work. With the help of his father and his brother, the following year when he was 19 years of age, he set up the first works in the world for manufacturing synthetic dye for commercial production of "mauve." It was not until 1878 at the age of 40 that he abandoned his active connection with manufacturing and devoted himself entirely to research.

Celebration of the Perkin Centennial is taking place September 10-16, at The Waldorf-Astoria, New York. International Day, September 10, is sponsored by the American Standards Association and the International Organization for Standardization.

National Meetings on Standards—

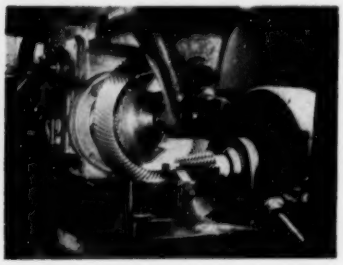
Preliminary programs for both the Fifth Annual Meeting of the Standards Engineers Society (October 3-5) and the Seventh National Conference on Standards (October 22-24) are now available.

For additional information see the September issue of THE MAGAZINE OF STANDARDS or write the Standards Engineers Society, Box 281, Camden, N. J.; and the American Standards Association, 70 East 45 Street, New York 17, N. Y.

The Future of Standards—

Two articles in this issue point to questions that will grow more pressing as time goes on—"automation" and "what is the scope of ASA." Men who have taken leadership in nationwide standards for many years are authors of these articles. Their ideas have been crystallized and presented after careful consideration. Undoubtedly, these ideas will be given the same careful consideration by all interested in the future of standards.

The Front Cover—



The spiroid gear, shown in the cover picture being hobbed, has desirable and long-sought properties for certain types of instruments. It should be considered as a valuable contribution to the gearing art, says Mr Louis Martin in his article, page 229. Spiroid gears can be produced readily on any standard hobbing machine, as shown in this cover picture.

Revised American Standards on fine-pitch gears, recently published (page 234) should be followed as far as possible, Mr Martin declares, to keep production and checking practice up to date with present needs.

This Month's Standards Personality

LOUIS D. MARTIN, gear consultant and authority on gear standards, is best known for his work on fine-pitch gears. When the American Gear Manufacturers Association presented to him the Edward P. Connell Award in 1948, it cited his "immeasurable contributions to the gearing industry's knowledge, particularly in the field of fine pitch gearing."

As the first chairman of the Fine Pitch Gearing Committee of the American Gear Manufacturers Association, Mr Martin was responsible for leadership that has brought about development of the present American Standards for fine pitch gears.

He is a member of three AGMA committees, secretary of ASA Sectional Committee B6 on gearing, and chairman of the Subcommittee on Fine Pitch Gears of Sectional Committee B6.

Mr Martin's name is well known in the technical field as a result of the many talks he has given on the subject of gearing and the 30 or more articles he has written. His work on gears is by no means done entirely with words or on committees, however. He has been awarded 22 patents covering gear-checking equipment, gear-cutting equipment, and photographic apparatus. Among his contributions is the Kodak Conjugage Gear Checker.

Louis Martin has worked hard from childhood. When his father was killed in an automobile accident, he was forced to go to work at the age of 13. Apprenticed as a tool maker, he started working at five cents an hour, 59 hours a week. Despite these long hours, he completed his grammar school education and one year of high school by attending night school four nights a week.

After finishing his apprenticeship as a tool maker, he decided to continue his education. To earn enough money, he sometimes held down three jobs at the same time. This made it possible for him to finish high school, and to graduate from Cooper Union Institute with a degree in Mechanical Engineering.

Mr Martin's gearing education began at the Brown-Lipe-Chapin Company of Syracuse after World War I. Starting there as a Junior Engineer, he left after a year's service to join the Northeast Electric Company of Rochester, now a division of General Motors. There he did gear research on speedometer and automotive gearing. He had been with Eastman Kodak Company from 1926 until July 1956, when he retired and started his own gear consulting company.

Outside the immediate field of gearing, Mr Martin is a member of the Rochester, New York, chapter of the American Society of Tool Engineers, a member of the American Society of Mechanical Engineers, the Monroe County Chapter of Professional Engineers, and the Industrial Mathematics Society of Wayne University.

When he can find time, he enjoys gardening—particularly working with roses.

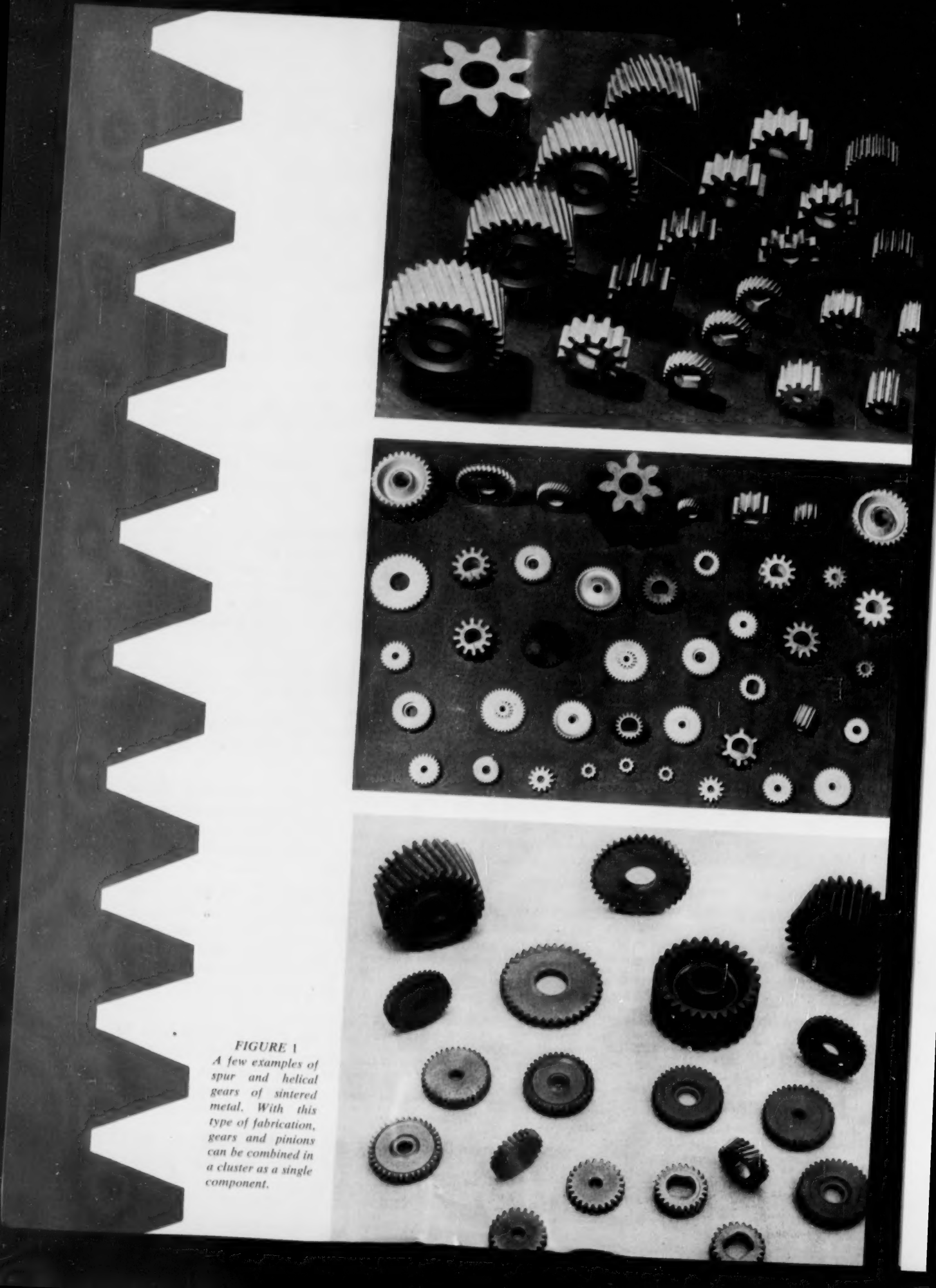


FIGURE 1
A few examples of spur and helical gears of sintered metal. With this type of fabrication, gears and pinions can be combined in a cluster as a single component.

An Objective Look at the Field of

Instrument Gearing

Abstracted from a paper presented at the Twenty-Fourth Annual Meeting of the American Society of Tool Engineers, at Chicago, Illinois, March 19-23, 1956.

by LOUIS D. MARTIN

THE field of Instrument Gears ranges from simple, commonplace items well known to all of us -- to veritable monstrosities employing hundreds of gears used to trace and direct the flight of guided missiles on their course.

There are currently in use 13 different tooth-form systems and 19 different *types* of gears. Instrument gears cover a pitch range of 180 different pitches. Of the 13 different tooth-form systems, it would be theoretically possible to reproduce 10 of these tooth-form systems on each of the 19 different types of gears. If this figure is multiplied by the pitch range, we come up with the imposing figure of 34,200 gears of different kinds of tooth form having a different pitch but the same number of teeth. If we consider an assortment of 100 gears of *different* numbers of teeth for each pitch, the aggregate will be 3,420,000 gears.

Tooth-form systems in Instrument Gears vary widely. Many are peculiar to an industry like the watch industry. This industry had to develop its own tooth-form standards and even its own equipment. The industry is steeped in antiquity. Many of its design and manufacturing practices have been handed down through the generations.

Other branches of the instrument field also have adopted their own special and preferred tooth forms.

World War II created an unprecedented demand for vast quantities of precision gearing for all types of instruments. Industries that hadn't the least knowledge of fire-control devices were suddenly forced into the business of producing precision instrument gears.

In 1942, Walter P. Schmitter, then president of the American Gear Manufacturers Association, recognizing the utter lack of standards which could serve as guides for this expanding field and help in our national war effort, created the Fine-Pitch Gearing Committee. Today we have standards to guide the instrument gear field that have withstood the acid test of time and trial.

Instrument gears are made of many materials ranging from tool steels to paper-base phenolic plate. The material choice must necessarily be broad because of the wide and diversified service requirements.

The manufacturing processes are also diversified. They might be listed as follows:

1. Milling
2. Hobbing
3. Gear shaping
4. Stamping
5. Cold-drawn pinion wire
6. Die casting
7. Cold extrusions
8. Sintered metallurgy
9. Injection molding
10. Grinding

Subsequent refining operations often consist of shaving, grinding, and lapping following cutting.

Costwise, instrument gears vary from a fraction of a cent for die cast pinions used in speedometers, to $400 or more for a single gear used in classified armament projects.

The instrument gear field might be called the stepchild of the gear industry. Equipment peculiar to its needs has not been developed in this country to the same extent that it has in other countries.

It is a strange corollary that the great impetus given to the production of instrument gears by methods other than cutting processes follows closely a struggle for more suitable gear-cutting equipment. High-density powdered metals have been developed with tensile strength of 125,000 psi and higher. A great many gears for a variety of different appliances are being made of sintered metals. Figure 1 shows a few examples of spur and helical gears made of high-density iron. One of the advantages of this type of fabrication is that gears and pinions can be combined in a cluster as a single component. It is also possible to eliminate operations by combining

Mr Martin was Gear Consultant with the Eastman Kodak Company when this article was written. On July 1, 1956, he opened his own office as L. D. Martin and Associates, Gear Engineers, at Rochester, New York. Mr Martin is secretary of Sectional Committee B6 on gearing and was the first chairman of the Fine Pitch Gearing Committee of the American Gear Manufacturers Association. He is chairman of the Subcommittee on Fine Pitch Gears of Sectional Committee B6.

cams, coupling, and similar parts with gear teeth and include keyways or splines in the bore of the gear.

A variety of different materials is currently being sintered ranging from brass, bronze, iron, alloy irons, and stainless irons.

In the appliance field, powdered metallurgy is effecting some dramatic savings. The art of producing molds for the coining process has advanced greatly in the last five years. Most of the sintered gearing falls in the category of good commercial to low precision type, as defined by American Standards for fine-pitch gears.

About ten years ago, injection molded nylon gears began to appear in a number of appliances. The early attempts at fabricating gears by this method were far from successful because the molding companies knew very little about the art of gearing and had not yet learned how to compensate for mold shrinkage.

A great fund of empirical data has now generally been accumulated on the behavior of this material. A large mid-western university is currently conducting tests under grants from the manufacturers of the material that will be of great value to design engineers in specifying nylon gears.

Injection molded nylon gears are currently being used in a large variety of appliances such as electric timers, clocks, meters, food mixers, speedometers, motion picture equipment, and a long list of devices. Figure 2 shows a few examples of injection molded nylon gears taken out of current production. As with sintered metal gears, large savings are possible by combining gears with other components and by making gears and pinions integral with each other as clusters.

Inherent in the molding process are factors which require the use of multiple-cavity molds for best economy. This results in great economies in manufacture and a low piece price. The quantity required must, of course, justify the mold cost. Single-cavity molds for small parts are used to produce prototypes and are generally combined with other molds for short runs. So-called family molds where dissimilar parts, often of a wide range of size, are combined, are not practical for regular production.

One of the chief factors of success in the production of injection molded nylon gears is painstaking attention to the design and manufacture of the mold cavities. Other factors are a comprehensive knowledge of the behavior of nylon and a fund of empirical data to draw from in determining mold shrinkage. Quality-wise, nylon gears range from a commercial two class to a commercial four class as defined by American Standards for fine-pitch gears.

Probably no other material or process that has appeared on the scene of industrial progress in recent years has offered more opportunities for savings and improvement in product than injection molding and nylon FM 10001.

Instrument gears are not necessarily small gears as many think. The determining factor is diametral pitch, or number of teeth per inch of diameter. Instruments vary widely both in size and function. Figure 3 gives you an idea of what might be expected in size range. Obviously, fabricating and inspection equipment must be highly diversified to meet the requirement of this field of gearing. Of the several tooth form systems developed for the instrument field, American Standard 20-degree Involute Fine-Pitch System, B6.7-1950[1], has best met the needs of the great majority of instrument gears used in consumer goods.

Standards are not irrevocable mandates imposed on industry merely for the purpose of establishing uniformity. Standards should be considered only as guides and as the practices established by the general consent of users, makers, and designers of a product. Good standards which endure and become popular in use allow for a freedom of choice and for minor departures from their basic principles. It is like this – we know that U.S. Route 20 goes from Chicago to Boston. It is the most direct route between these two cities. In going from one city to another over this route, we may encounter a number of detours. If we watch our step when we make the detours, we will be able to get back on Route 20 without difficulty. If we do not, we may wander aimlessly and get lost. It is good engineering to follow accepted standards whenever possible. There are exceptions.

In the field of gearing, the best design for a given application cannot always be obtained by following a single set of rules. This is especially true in the field of instrument gearing, which is highly diversified. In this field, it is frequently necessary to depart from accepted practices to some extent without necessarily abandoning the general principles of standard tooth-form systems.

A notable example of highly specialized designs in which no single tooth-form standard will completely satisfy is found in automotive gearing. In this field, the gears are designed to meet the power requirements of the engine. Designs differ widely from make to make and car to car. Every time the power of the engine is changed, the gears used to transmit the power must also be changed. Pressure angles, helix angles, and face widths vary widely. The important thing in automotive gearing is the transmission of power quietly for long periods of time in the smallest possible space. Cost is also important.

On the other hand, in certain types of equipment where the transmission of uniform motion is of prime importance, and where loads are generally light, the geometry, shape, and material of the gears may be very different from that of automotive gears. The very type and shape of motion drive gears may be predicated by the accuracy requirements. Automotive gears would be absolutely useless in such applications.

By the same token, if the same design procedures were followed in automotive gearing that are used in very high-grade instrument gearing, the probabilities are that the gear

[1] Since preparation of this paper, a new edition of this American Standard has been approved, identified as AGMA 207.04 and ASA B6.7-1956 (page 234).

box of an automobile would be bigger than the engine, and that the gearing would cost more than the entire car.

Each gear application must be studied as an individual problem for best results. Standards should be followed as much as possible but one should have no qualms about departing somewhat off the beaten path if consumers' requirements are met.

It is even so with instrument gears. Standards are established and developed to meet the requirements of the average, or greatest number of cases. They must be changed from time to time to keep pace with new ideas.

Figures 4 and 4A show two sets of spiroid gears introduced recently by the Illinois Tool Company of Chicago. They are a recent addition to high ratio right-angle drives, looking like hypoid gears commonly used in automobiles. The pinion, which is in the form of a conical thread, may have one or more threads.

While it is claimed by some segments of the gear industry that the spiroid gear is not new and its properties are similar to other existing types, the fact of the matter is that it remained for a new set of minds, unhampered by traditions and holy of holies, to find the flaws in previous attempts. The spiroid gear can be produced readily on any standard hobbing machine (see cover). It should be considered as a very valuable contribution to the gearing art.

Another unorthodox solution to an instrument gear problem follows.

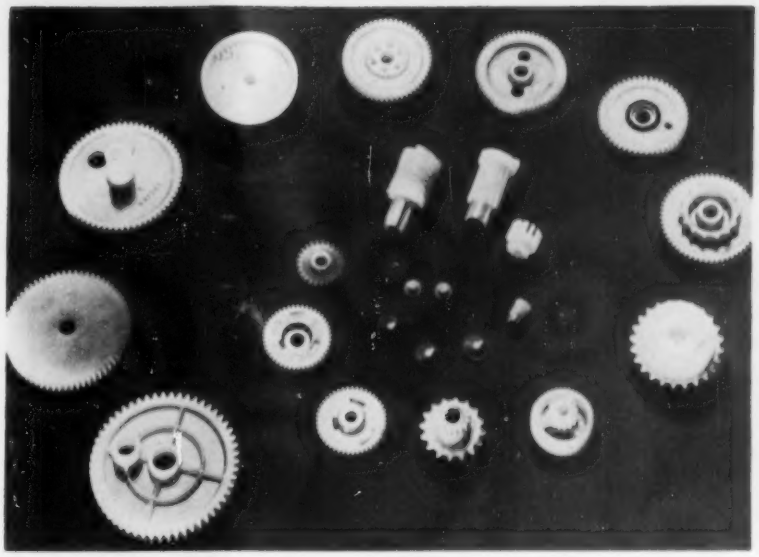


FIGURE 2. Some injection molded nylon gears currently being produced.

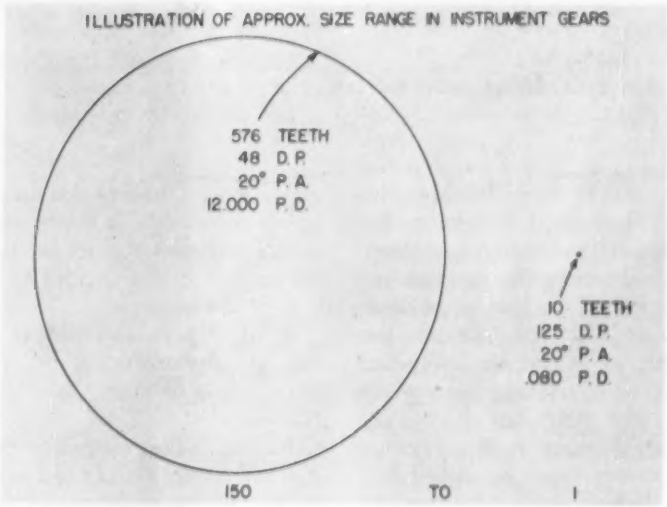


FIGURE 3. Diversified equipment is needed to handle wide range in size.

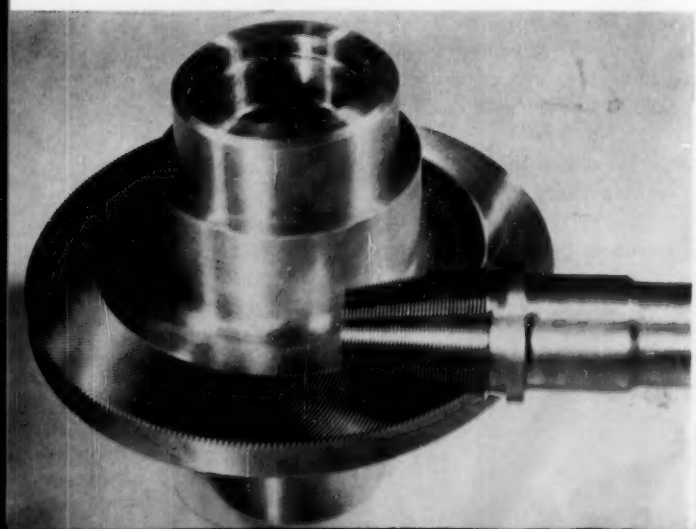
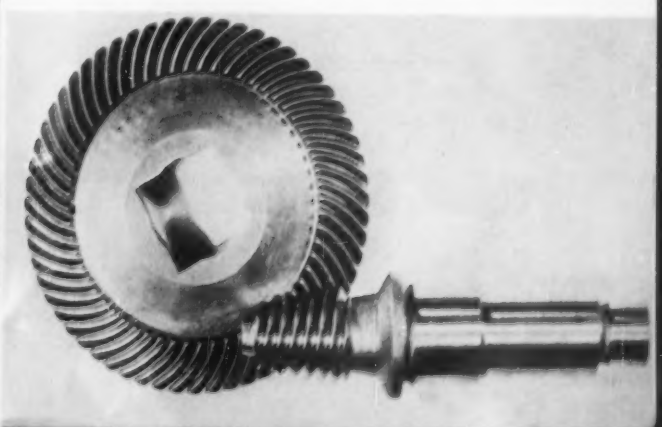


FIGURE 4 AND 4A. These spiroid gears are a recent addition to high ratio right-angle drives. The pinion, in the form of a conical thread, may have one or more threads.



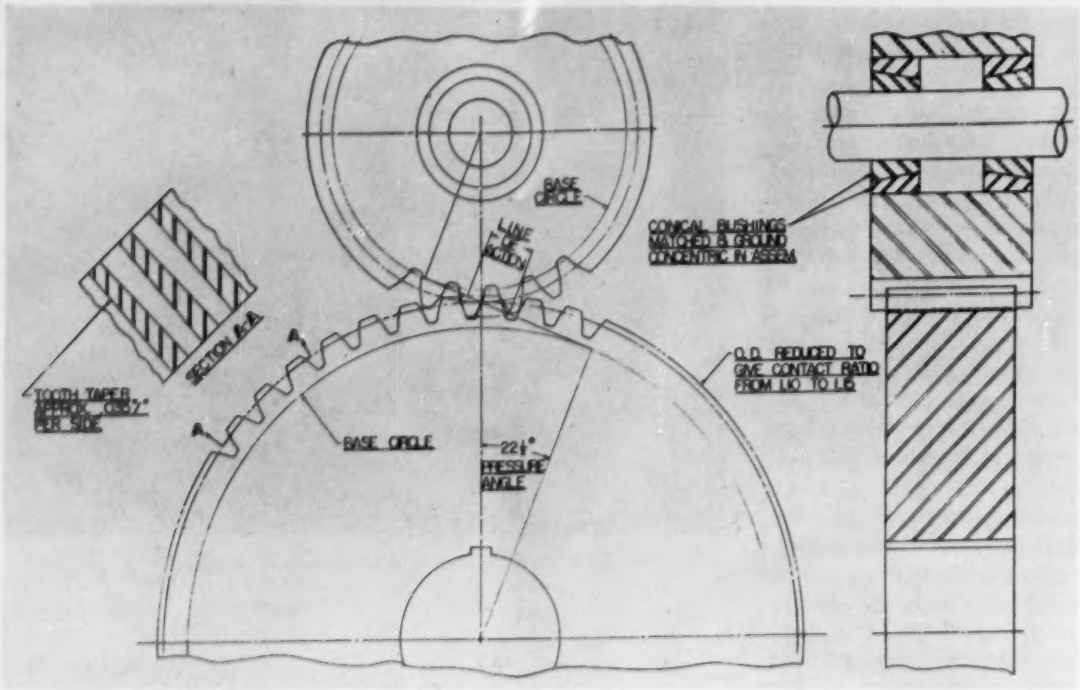

BASE CIRCLE
LINE OF ACTION
CONICAL BUSHINGS MATCHED & GROUND CONCENTRIC IN ASSEM.
O.D. REDUCED TO GIVE CONTACT RATIO FROM 1.10 TO 1.15
SECTION A-A
BASE CIRCLE
22½° PRESSURE ANGLE

FIGURE 5. Gears with tapered teeth were selected to eliminate backlash. Tooth taper shown here is 0.035 per inch, per side, sufficient to take care of all variables.

In an instrument drive, a gear train was required to reverse the direction of a slide which was driven by a lead screw. The backlash requirements at the lead screw were extremely close – so close, that the problem seemed to be insolvable. The service requirements were pretty tough, with high loads and life expectancy. Fortunately, space restrictions were not too critical and cost of the device warranted the very best type of gearing possible. The main objectives were to have no measurable backlash and low inertia loads coupled with good surface durability of the gear teeth.

Time does not permit a complete analysis of all of this problem; only one segment of the solution can be indicated.

First, in order to eliminate backlash, it was decided to use gears with tapered teeth. The tooth taper decided upon was 0.035 per inch, per side, as shown in Figure 5. This amount of taper was more than sufficient to take care of all the variables.

Second, since the elimination of all lost motion requires also the control of eccentricity in the bearings, as well as control of gears and bearing centers, it was decided to use Class 7 ball bearings.

Third, all gears were made of carburized alloy steel and the teeth were ground to master gear specifications.

Fourth, conical expanding bushings which were marked and ground in pairs so that the outer surface of one member was perfectly concentric with the bore of the inner member were specified.

Fifth, in order to obtain beam strength and a low scoring pvt power, velocity, tooth geometry) factor, 22½-degree pressure angle was used. The contact ratio was held from 1.10 to 1.15.

Also, in order to obtain the best condition of profile-sliding and to get action as far away from the base circle of the pinion as possible, the gear teeth were stubbed while those of the pinions were not.

The solution to this problem depended on a comprehensive knowledge of the gear art, imagination, and know-how, based on experience.

Last summer I visited a plant on Long Island. They have developed a technique for checking the angular transmission error of motion-drive gears involving the use of theodelites and interferometry. The errors they are looking for and can repeatedly verify are on the order of two or three seconds of arc in 360 degrees. They showed me an optical zeroing device which has a sensitivity of one-fifth of a millionth of an inch. This is hard to conceive and staggers the imagination.

The gears they were checking, the day I was there, were cut on a custom-built Gould and Eberhardt hobbing machine which was mounted on a 25-ton block of reinforced concrete. The exact location of the machine, in the building in which it was housed, was determined by seismographic tests. The room was temperature-controlled. I learned that this company spent considerable time and money in refinements on the hobbing machine in an effort to improve its accuracy. The hobs they were using were also custom-

made to an inconceivably great degree of accuracy and cost them approximately $1200.00 each. Extremely accurate hob sharpening equipment is used. They had found that to obtain the accuracy they required, correct hob sharpening was of paramount importance and that the greatest single source of error was lead distortion.

In order to reach their quality objectives, a great many contributing factors had to be evaluated and each guarded against in their order of importance. All hobs are designed with the same number of gashes which correspond to the notches in the precision index plate of the hob sharpening machine.

This was surely a different world of gears.

In the same building, in another area, I saw injection molded nylon gears being assembled in a mechanism and, not far from this area, they were using stampings and pinions made of pinion wire in a cheap appliance. These two types of gears were as far apart as the poles.

One of the world's largest companies has an almost inconceivable spread in quality in their gearing. In one plant where some of the most accurate ship-propulsion gears are made and where accuracy is of extreme importance, a single gear set may cost more than $200,000.00. In another plant manufacturing electric timers and clocks, gears may cost $3.00 per thousand: an inconceivable cost spread of 33 million to one.

Gear quality is relative, it depends on what criterion we use for evaluation. The revised American Standard, Inspection of Fine-Pitch Gears, recognizes the fact that there may be more than one yardstick of quality required to meet the needs of industry. While the composite check is the basis of quality, in this standard, because it meets the requirements of the vast majority of fine-pitch gears, it leaves the door open for other methods of checking gears.

Nowadays very few parts are checked 100 percent. Inspection frequency is based on statistical studies that take into account the laws of random distribution of errors. The cost of inspection should be compatible to the cost of the finished product and except in rare cases, where safety of personnel is a factor, it should be based on three things: first, the cost of the part; second, the replacement cost of that part in the mechanism; third, the selling cost of the item. This philosophy is particularly applicable to instrument gearing.

Historically, the composite or functional check, as it has been called recently, antedates all other methods of checking gears. Long before gear checking pins and comparators were invented, gears were checked by rolling one with another and "feeling" the tooth action. Later came gages with fixed centers, and still later, with variable centers. The advancement of the functional check was inter-related with the perfection of master gears of suitable quality and the incorporation of certain desirable features in the variable center distance gages.

Figure 6 shows a relatively simple functional checking fixture. This fixture, like many others of a recent vintage, is equipped with pressure control between master and work.

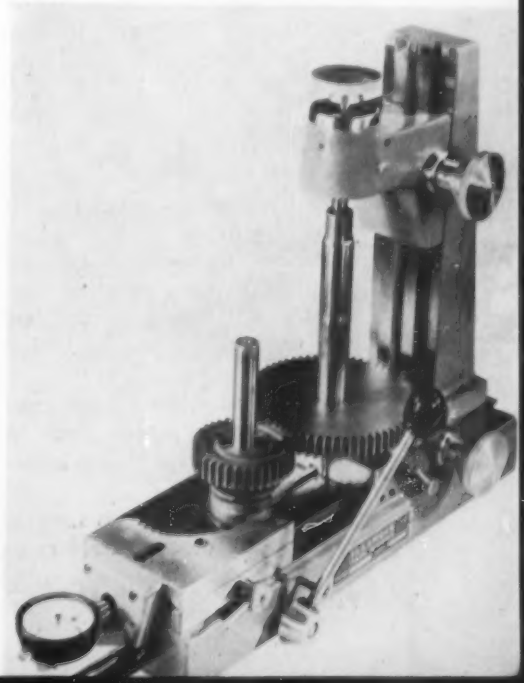
The last decade has seen many great advances in the functional check technique. Dozens of different fixtures of variable center distance, used to check gears, have appeared on the market both in this country and abroad. It seems strange that while checking pressures had been established for such things as gage blocks and measuring wires, the influence of pressure on the checking of gears had not been given due consideration until relatively recently. American Standard B6.11-1951[2] (AGMA 236.03) was, to the best of my knowledge, the first attempt at giving guides for suitable checking pressures of gear teeth. Today, all modern checking gages have this feature.

Gearing has emerged from the status of an art to that of a science and, because of its complexity, it deserves more than casual consideration. Gearing, today, is a recognized specialized branch of mechanical engineering like pediatrics in the medical profession or patent law in the legal profession. Most companies using gears have set up specialists to handle their gear problems. Even very small companies find that it pays dividends to submit their gear problems to gear consultants.

To the young engineer and draftsmen who want to design a gear train: — Don't accept the material on gearing you find in text and handbooks as the gospel truth. Look for principles rather than a complete solution to a problem. Textbooks and handbooks lag behind current practices by at least five years, often more. Your best source for late gear information is in American Standards which are as up-to-date as it is possible to keep standards. Every few years they have to be reviewed.

The field of instrument gearing is tremendous and continually broadening. Interplanetary travel will surely come, in the not too distant future, and you can just bet your last dollar that when it comes, somewhere in the "innards" of the trans-planet monsters will be an aggregation of devices chuck full of precision instrument gears. The challenges this field poses stagger the imagination.

FIGURE 6. A simple variable CD (center distance) gage equipped with pressure control between master and work.



[2]New edition recently approved as ASA B6.11-1956 (AGMA 236.04).

Revised Fine-Pitch *Gear Standards* Meet Needs of

by LOUIS D. MARTIN

AMERICAN STANDARDS are subject to frequent revisions in order to keep them abreast of developments. Every few years, every American Standard must either be reaffirmed or revised by its sponsors.

Gearing standards are jointly sponsored by the American Gear Manufacturers Association and by the American Society of Mechanical Engineers. It is the responsibility of these two organizations to see to it that gear standards are reviewed and kept up to date.

Among the standards recently reaffirmed or revised is a group of four fine-pitch gearing standards. In 1954 these standards came up for review. It was decided by the sponsors to reaffirm American Standard Fine-Pitch Straight Bevel Gears, AGMA 206.03; ASA B6.8 - 1950. This standard, in its present form, adequately meets the requirements of current fine-pitch straight bevel gear practices.

Three other standards were revised. Among these three was American Standard 20-Degree Involute Fine-Pitch System for Spur and Helical Gears, AGMA 207.04; ASA B6.7 - 1956. The revisions to this standard consisted of simplification of several examples, elimination of minor typographical errors, and addition of a format for putting gear dimensions on drawings in a logical, consistent manner, agreeing with AGMA and American Standard gear nomenclature and established gear practices.

The format idea has been under development for several years. A format for each type of gear is contemplated.

It was considered advisable to develop and process the formats through the standards "mill," separately, rather than to wait until one for each type of gear had been developed. This permits the immediate use of a greatly needed guide. As each of the other formats are developed by the sponsors, it is contemplated that it will be added as an appendix to existing standards. Eventually, a separate gear-format package, covering all types of gears, may be developed as a separate standard.

Another fine-pitch standard recently revised is titled American Standard Design of Fine-Pitch Worm Gearing, AGMA 374.03; ASA B6.9 - 1956. Most of the revisions in this standard were of an editorial nature. Among the major improvements is the adoption of a non-throated, simplified gear blank. This type of blank is suited to worm gears of fine pitch which are generally not highly stressed. A separate section covering blanks is also included in the revised standard.

The worm gearing standard is unique in including tables giving the change in profile shape and pressure angle which occurs when using a double conical wheel or cutter for forming the tooth profiles. The original development of these tables entailed a considerable amount of computation and work. Because the standard covers a finite pitch range, it was possible to develop a practical and very useful guide. For those not versed in the many ramifications to worm gearing production, it will be of interest to know that a single computation for profile deviation and pressure angle change may take two to three days and involves the use of higher mathematics.

It was with the purpose of eliminating this cumbersome time-consuming job that the tables were developed. During the five years they have been in use, they have proven very useful in the gearing as well as screw-thread field.

Explaining the meaning of profile deviation in simple terms that can be grasped by the average gear man posed a problem. Many gear people, it was discovered, did not have a clear concept of exactly what was meant by profile deviations and what could be done about it. The value of the tables, therefore, was not fully appreciated.

An appendix was added to this standard, giving a simple graphic explanation of profile deviation with sufficient references for the inquisitive student who wants to find out for himself what is involved in the way of computations.

American Standard Inspection of Fine-Pitch Gears, AGMA 236.04, ASA B6.11 - 1956, received critical review and considerably more attention than other fine-pitch standards. As a result, this standard is a great deal better and should receive wider use than the original version. This standard, which includes ten sections, was originally developed section by section by the American Gear Manufacturers Association. Due to the urgency of guides for quality control of fine-pitch gears used in the war effort, each section was released as developed. When all the ten sections were finally developed and assembled together, they were submitted by the sponsors to the American Standards Association.

In spite of a thorough editing job at the time, certain ambiguities crept in which were a perpetuation of old-

Industry

fashioned ideas and innocuous redundance. For example, backlash was confused with tooth thickness reduction as applied to a single gear. We know, by definition, that backlash is the play between engaging gear teeth and that a *single* gear cannot be said to have backlash until it is meshed with a mating gear. Nevertheless, the section on backlash was ambiguous in this regard.

It must be remembered that standards reflect the composite thinking of many schools of thought, and are the best compromise that can be effected in the thinking of diverse individuals of a given era. They should be accepted as foundations to build on, rather than finished, unchangeable documents. As time passes, and new ideas are developed, the thinking changes. It was even so with this standard. Today we are willing to accept principles and ideas that were considered too drastic eight or ten years ago. The changes and improvements in this standard are:

1. Elimination of ambiguities.
2. New section on backlash.
3. Addition of tables by means of which it is possible to set limits of variable center distance fixture for any combination of tooth reduction and composite error within the scope of the standard.
4. Inclusion of latest rack and similar checking devices.
5. An appendix explaining the use of the table mentioned in item 3 and the essential differences between checking by means of a rack and circular master gear.

The major part of the revisions was undertaken by the Fine-Pitch Gearing Committee of the AGMA and the ASA Subcommittee on Fine-Pitch Gearing under Sectional Committee B6. The personnel of these two committees should feel gratified that this was a job well done.

AUTOMATION

by R. C. SOGGE
President, U.S. National Committee
International Electrotechnical Commission

Presented at the IEC meetings at Munich, Germany, June 26-July 6

IN the past few years the word "automation" has been used with a wide range of meaning. Few subjects have been more publicized in recent years than automation. If you were to assemble all that had been said and written in just the last year on automation, you would have the distinct impression that many of us have been like Aesop's blind men, each of whom defined an elephant in terms of the part he was able to reach and touch.

Some have pictured automation as a fearful and revolutionary thing, others as a normal and evolutionary development in manufacturing progress. Some have pictured automation solely in terms of giant computers, others in terms of materials handling systems.

Under these circumstances it seemed most desirable to assemble information which would help provide the proper understanding and that would serve as a basis for making a decision on what standardization was desirable and what could be done most effectively by the IEC.

Automation has been referred to as the "linkage between machines." A definition used within my own company is, "Automation is a way of manufacturing based on continuous automatic production. This includes automatic handling, automatic making, inspecting, assembling, testing and packaging of parts and products in one continuous flow." This is a definition which describes an ideal situation but few companies, if any, are even close to continuous automatic production, except perhaps on a very limited scale. If we were to group manufacturing operations into three broad areas—the *Manual Area*, the *Mechanization Area*, and the *Automation Area*—we would find that manual operations are remarkably common today, even outside the tool room. On the production lines of our most mechanized plants, people still put things together by hand – and they measure, finish, sort, lift, and move the parts or products in process by hand.

In the Mechanization Area, manually operated power-driven machines with varying degrees of control are used to perform one or more operations. Manufacturing operations – and handling between them – may both be mechanized. But they are not tied together.

Automated production grows naturally out of complete mechanization. An automatic machine can be, and often is, tied to the Mechanization Area simply because it must be loaded and unloaded by hand. In the Automation Area, automatic machines are integrated with transfer devices and electric control to perform a series of automatic operations.

Automation is an evolutionary concept and not a second industrial revolution. It has been developing since the early 19th century which saw elements of automation, as yet unnamed, in such things as the Jacquard Loom, the Evans Grist Mill, and the flyball governor of Watt's Steam Engine.

Today the principles of automation are being systematically applied by more and more businesses to the solution of their manufacturing problems.

Automation requires a large overhead investment. Whether such an investment can be justified or not will be determined by the volume of

identical parts or products to be manufactured. Standardization is the key to automation. In addition to a standardized product to be manufactured, it is essential that the materials be standardized in order to assure uniformity. Tolerances must be standardized to confine variations within a zone which the automatic machinery can successfully handle. The results from automation are to be found in increased productivity per manhour and per unit of floor space. With the decreasing availability of both labor and engineering talent, there will be an increasing need to consider automation in more and more manufacturing operations.

As more attention is given this subject, one approach will be in the standardization of data processing and the machines which are being rapidly developed for that purpose. As electronic parts and electronic circuits are being adapted to use for this type of product, there has been more activity by the manufacturers of electronic equipment, and there has been some committee work done in the Radio-Electronics-Television Manufacturers Association.

A RETMA committee has defined automation as, "The technique of improving human productivity in the processing of materials, energy, and information by utilizing, in various degrees, elements of self-control and of automatically executed product programming."

Consideration is being given to standardization of computers and calculators, but this work has not progressed far enough to develop definite standardization projects. In view of this situation it seemed that the U.S. delegation might best present information on what is being done in the States in the form of a color movie which is part of the "Live Better Electrically" program promoting a greater use of electrical service.

Here Mr Sogge showed G-E's color movie on automation.

International Delegates Agree on *Electrical Standards*

Seven hundred delegates, representing the electrical industry of the world, concluded ten days of work on international electrical standards on July 6 in Munich, Germany.

Seven new recommendations of the International Electrotechnical Commission, the world's standardizing body in the electrical field, were authorized for publication by the organization in the interest of promoting international trade. Sixteen draft recommendations were accepted for circulation to the National Committees of the 32 nations of IEC and eight revised draft recommendations were authorized for final circulation.

The United States National Committee of IEC, an arm of the American Standards Association, was represented at the meetings (June 29 - July 6) by 51 delegates including the following USNC officers: R. C. Sogge, Manager, General Electric's Engineering Standards, president USNC; Vice Admiral George F. Hussey, Jr, USN (ret), managing director, American Standards Association, treasurer USNC; J. W. McNair, assistant technical director, American Standards Association, secretary USNC; and S. David Hoffman, in charge of the Electrical Department of ASA, and assistant secretary USNC. Dr Harold S. Osborne, retired chief engineer, American Telephone and Telegraph Company, and former president of the IEC, attended as a delegate-at-large.

Clarence H. Linder, vice-president – engineering, General Electric Company, highlighted the meeting with the second Charles LeMaistre Memorial Address, a lecture established to bring before the IEC annually a prominent international figure in the electrical field.

Among the agreements reached at the meetings was the formal adoption of the name "Tesla" for the unit of magnetic flux density in the Giorgi (MKS) system.

As the centenary of the birth of Nikola Tesla was being held in Belgrade, Yugoslavia, during July, the IEC sent the following message: . . . "It is always with a sense of profound respect and admiration that Tesla is remembered throughout the electrical world, and the IEC is mindful that its work today for international agreement in the electrical field is dependent to a very large measure on the fundamental scientific work of Nikola Tesla. The IEC is very happy that the fact has been marked this year by the agreement it has reached."

The IEC Committee on Aluminum brought before the group three draft specifications which were agreed upon and which will be published as IEC Recommendations. They deal with aluminum alloy electrical conductor wire of the Al-Si-Mg type, commercial hard-drawn wire, and aluminum busbars.

A draft specification for galvanized steel wire for reinforcement of aluminum steel conductors, including requirements for zinc coating, was authorized by IEC to be circulated to the national committees to be studied and voted upon.

A new international committee, which will operate as a subcommittee of IEC Technical Committee 2 on Rotating Machinery will deal with carbon brushes for rotating machinery. Also approved were new proposals on standard rating of 50-cycle steam turbines, together with steam pressures and temperatures.

In the radio-communications field, a highly valued document was authorized for publication as an IEC Recommendation – Recommended Methods of Measurement on Receivers for Frequency Modulation Broadcasting Transmissions. Another document on radiation measurements was accepted for circulation. At the end of a six-month study period by the national committees, the IEC will act on the final form by approving it as a Recommendation.

The national committees having acted in favor of a document on the method of test for volume and sur-

face resistivities of insulating materials, the IEC Committee of Action accepted it as an IEC Recommendation. Another document on primary cells and batteries was also approved by the Commission for publication.

R. C. Sogge, president of the USNC, at the request of the IEC, presented a survey of what is being done in the field of automation in the United States (see page 235). The information was directed at helping "provide the proper understanding and to serve as a basis for making a decision on what standardization is desirable and what could be done most effectively by IEC."

Mr Sogge told the group: "Automation requires a large overhead investment. Whether such an investment can be justified or not will be determined by the volume of identical parts or products to be manufactured. Standardization is the key to automation."

A statement on the peacetime uses of atomic energy prepared for the United Nations pointed out that the IEC is considering how the development of nuclear fission in industry affects electrical equipment, components, and electronic instruments.

The organization stated that it wished "to make clear its anxiety to press forward in these fields and eventually in others where the need arises, to help forward the development of nuclear power by such action."

The 1957 meeting of the IEC will be held in Moscow, where delegates will be guests of the USSR National Committee of IEC from July 2-12. Sweden's invitation to meet in Stockholm in 1958 has been accepted.

The International Electrotechnical Commission, which develops standards in the fields of electrical engineering and communications, is a federation of the national committees of 32 countries. The Commission endeavors to promote understanding among the electrical engineers, scientists, government officials, and industrialists of its member countries in order to further world trade.

What Is the Scope of ASA?

by JOHN R. TOWNSEND

Mr Townsend is chairman of a Special Committee on Scope of Activities of the American Standards Association. He is Director of Materials and Standards Engineering, Sandia Corporation; a past president of the American Society for Testing Materials; and represents ASTM on ASA's Standards Council. He was chairman of the Council from 1952 to 1954.

Reason for ASA

"In these times when astronomers scan the sky with radio receivers, when medical experts cooperate with aeronautical engineers to build high-performance aircraft that are capable of being operated by humans, and when the family doctor uses radio transmitters to warm our insides, who can predict what other sciences may suddenly find themselves partners in important and even vital projects.

"If we must share certain tools among the sciences, we are compelled to use our best efforts to provide a single, consistent, and nonconflicting solution to the problem. Any proposal that does not provide effectively for a full coordination of interests at the working level in both the development and use of this type of standard must offer some extremely valuable and otherwise unattainable result to justify its acceptance."

—*Harold Westman, chairman, Graphic Standards Board*—

WHEN we pause to consider the origin of standards, we become overwhelmed by the thought that standards are an organic part of nature itself. In the first place, we have the law of genetic continuity, which states that like produces like and there is no gradation in characteristics of living things between species. Each specie seems definite and distinct and when new species are produced they have their own definite characteristics.

It is clear to every physicist that the physical world is based on the structure of the atom. Here, again, we have transcendental standardization.

The simplest standard with which mankind is familiar is the agreement by tribes, groups, and nations on the standard of language and communication with each other. All living creatures have standards of practices or behavior which we call instincts. It is only mankind that attempts to improve his habits and to establish new standards of conduct and per-

formance. We here see mankind as a social creature who must seek agreement with his fellows as to the standard of language, procedures, and rules for living together. At the dawn of civilization it was evident that there must be agreement on standards of length, mass, and time if trade, commerce, and cooperative enterprise were to be furthered.

Not so familiar is the summation of the various means by which mankind has arrived at compliance with standards. The earliest process of reaching compliance was by means of the club – the stronger man was the winner. So we have authority and fear, based on the test of strength.

The next movement was toward the civilizing influence of decision by vote, where the majority would win. Here, again, it was an assumption that in any event the larger number, or majority, could enforce its will on the smaller group. Nevertheless, decision by vote of the majority and agreement of the minority to abide by the decision of the majority represent a step in civilization, and hence in the promulgation of standards.

We next have the establishment of law; law basically established by vote of the constituents. Recourse of the individual to the law of the land, and interpretation of the law by the courts on the basis of judgment and precedent, also carry the right of trial by jury. It follows that the jury of twelve shall reach unanimous agreement as to the right or wrong under the law as interpreted by the judge. This represents a tremendous step forward in civilization. It was published in the U.S. Constitution of 1789 and the Bill of Rights proclaimed in 1791.

In many instances, the contestants against compliance do not wish to resort to law. Here, they agree beforehand to abide by a decision of an impartial arbitrator who will fairly hear both sides of the question and give a decision based on his background and experience. This is a familiar method of settling labor disputes and disagreements in the commercial world. Indeed, the process has been rather broadly applied and under a variety of circumstances.

There have been developed other methods of reaching agreement for consonance as to a course of action. Certainly the adoption of the U.S. Constitution and the Bill of Rights represent again an extraordinary advance in our civilization. The ratification of this law of the land by the separate states was strongly assisted by the special pleading contained in the Federalist papers.

The Society of Friends, a religious order, thought that compliance and human consent might be reached by entirely peaceful methods. Their approach was that anyone could bring a problem before their meeting and the proposal was considered to be unanimously agreed upon when silence indicated that there was no further single objection. This, of course, was based on the general understanding that if anyone objected he should make himself heard.

THE American Standards Association has before it the broad problem of acting as a federation of technical societies and organizations. It is important to the national effort that agreement be reached among these various organizations as to standards. In 1918 this organization was known as the American Engineering Standards Committee. It was later changed to the American Standards Association, and is now a broad federation of bodies that have specific interests in various fields.

In searching about for a means whereby compliance to an American or national standard might be arrived at, and to do this without recourse to law, the American Standards Association has very wisely selected the consensus principle. The consensus principle, which underlies all the work of the American Standards Association, is that there must be a consensus of those having a substantial interest in the scope and provisions of any proposed standard. This means that any group having a substantial interest has the inherent right of representation on the committee dealing with the subject matter of the standard. Thus, the Association provides the machinery through which the groups themselves arrive at a consensus.

This problem of agreeing on a course of action and exacting compliance from those affected is one of the most profound problems in our civilization. The soliloquy of Captain Ahab as he considers ways and means of inducing his crew to aid him in the destruction of Moby Dick is a case in point. Another was the discovery of an annotated copy of Machiavelli's *The Prince* among the personal effects of Napoleon after he was deceased. Both of these examples show the need of striving for a means of exacting compliance. Unhappily, these means relate to individual dictatorship. What is hoped for is the common espousal of a course of action, or adoption of a standard, that should react happily for all people. It is the belief that adoption of the consensus principle by the American Standards Association is both highly practical and fundamentally sound, as recent events have demonstrated.

The American Standards Association uses three methods in promulgating American Standards. The first method is by organization of a sectional committee. In the organization of the sectional committee, all groups having a substantial interest in the subject matter are included. The committee is thus made up of the accredited representatives of the cooperating bodies. Such a committee is balanced in organization between producers, consumers, and those with a general interest. The sectional committee may direct one or more of its bodies principally concerned to prepare the standard, or it may report a standard directly to the American Standards Association. The second method represents the existing standards method, under which the American Standards Association reviews the standard and determines whether it is satisfied that the necessary consensus of those substantially concerned with the scope and provisions of the standard has been achieved. A further method, which is intended for simple

projects and cases in which a more formal committee is unnecessary, is that in which an American Standard is arrived at by means of a conference of those substantially concerned, supplemented by written acceptances from these groups.

The scope of activities of the American Standards Association is thus a subject that is always before the Association. It is our intent that the Association should be responsive to the trends in national standardization as they develop. Our organization should be flexible enough to be responsive to these trends in order that the greatest possible service be rendered to American standardization as it evolves.

A recent event caused an intensive study and review to be made of the past activities of the Association, to orient our thinking with regard to the present and the future. It is the purpose of this article to present to the members of the American Standards Association a review of the results of this study, some of the factors concerned, and the general conclusions.

ON March 12, 1951, the American Arbitration Association submitted Standards for Commercial Arbitration to the American Standards Association for approval as American Standard. The chairman of the Standards Council referred the proposal to the Miscellaneous Standards Board for investigation and recommendation. An extensive review of this proposal was prepared, and in August of 1951 copies of the proposed standard were sent to 366 trade associations, 750 chambers of commerce throughout the United States and Alaska, and to the Arbitration Committee of the Bar of the City of New York.

This was probably the largest canvass that the American Standards Association had ever made in regard to the approval of a standard.

On January 6, 1955, the Miscellaneous Standards Board summarized the replies and agreed that the standards had a consensus of acceptance and therefore should be approved. The National Electrical Manufacturers Association voiced objections to the approval of the standards as an American Standard, however.

There was a considerable interchange of correspondence between the American Arbitration Association, the National Electrical Manufacturers Association, and the American Standards Association. It was the final feeling of the National Electrical Manufacturers Association that, whereas they greatly appreciated the thoroughness of the replies from the American Arbitration Association and the careful consideration that had been given the proposal, nevertheless it was their feeling that the standards did not come within the scope of the American Standards Association.

The matter was subsequently transmitted to the Board of Review. After a special meeting to consider it, the Board agreed that a consensus did exist but that the Standards Council should establish a policy as to whether the proposed standard came within the purview of the American Standards Association.

As the matter evolved, it was seen that the policy question should be resolved before further progress could be made.

The proposal was reviewed by American Standards Association's legal counsel for consideration of legal implications, particularly since the standard made reference to applicable local law. The matter was then referred to the Standards Council for reconsideration and review at its meeting on January 25, 1955.

There ensued considerable discussion of the proposal and it became evident that the principal difficulty with regard to the proposed standard had to do with probable inclusion in the purview of the American Standards Association not only of standards on technical subjects but also of standards of conduct and possibly ethics, as brought out in some of the wording of the proposed standard of the American Arbitration Association.

After considerable discussion, it was seen that the subject needed very careful historic and technical review far beyond what would be practical in an open meeting. Accordingly, the Council unanimously voted on a resolution that a special committee be formed to examine the range to which standardization activities of the American Standards Association should be limited and to submit recommendations as to policy to the Standards Council for consideration and for recommendation to the Board of Directors. It also voted that the selection of a special committee be referred to the chairman of the Standards Council.

Accordingly, the following committee was appointed by A. S. Johnson, chairman of the Standards Council:

J. R. Townsend, Director, Materials and Engineering Standards, Sandia Corporation, representing American Society for Testing Materials, *Chairman*

Paul Arnold, Assistant to Technical Director, Ansco Division of General Aniline and Film Corporation, representing Photographic Manufacturers Group

E. O. Mattocks, Engineering and Research Service, American Petroleum Institute, alternate representative for American Petroleum Institute

A. E. Pringle, II, Vice-President of Pringle Electrical Manufacturing Company, representing National Electrical Manufacturers Association

T. E. Veltfort, Manager, Copper and Brass Research Association, New York

Willis MacLeod, Director, Standards Division, General Services Administration, Federal Supply Service

Leon Podolsky, Technical Assistant to the President, Sprague Electric Company, representing Radio-Electronics-Television Manufacturers Association

This committee held a meeting on March 14, 1956. Previous to this meeting, a definitive dossier of the activities of the American Standards Association had been compiled by ASA's Technical Director from the minutes of the Standards Council and the Board of Directors, from the time of the organization of the American Standards Association to the present. This was circulated to all members of the committee for study. The chairman also prepared a statement for study by the committee which not only reviewed pertinent points from the data submitted by the American Standards Association staff but covered the legal references, reviews by the

American Arbitration Association, and the role of the American Standards Association in affairs of the day.

It particularly emphasized the need for the American Standards Association to be dynamic and broad in its approach to standardization affairs.

The members of the committee individually studied all of these notes and references, and agreed to hold a meeting for the interchange of ideas on March 14. At this meeting they finally reached unanimous agreement as to the scope of activities of the American Standards Association. This agreement is set forth in the minutes of that meeting and particularly in the formal action taken at that time. These official actions by the committee were as follows:

It was moved that the resolution of the Board of Directors, approved May 19, 1944, be submitted to the Standards Council for approval and recommendation to the Board of Directors for reaffirmation, and further that the words "but not exclusively" be inserted after the word "whether" in the resolution of the Board of Directors of May 19, 1944. This resolution would then read as follows:

". . . because of the growing importance of standards for consumer goods, the scope of the work of the ASA be broadened and clarified by removing the present restrictions which limit the work of the ASA to the engineering field; and that the ASA should be so organized that it can handle any standard or standardization project which deserves national recognition—whether, but not exclusively, in the field of engineering, accounting, business practice or consumer goods."

It was further proposed that the Committee on Scope of Activities of ASA recommend to the Standards Council, for proposal to the Board of Directors, the policy that any Member-Body of ASA or other organization be granted the right to object to a specific proposal which is believed not suitable in scope and content for approval as American Standard. In addition, it was proposed that a resolution prepared in 1945 by the secretary of ASA for consideration by the Board of Directors, and which had never been approved by the Board of Directors or Standards Council, be referred to the Committee on Procedure for consideration and possible improvement, with the recommendation that it be called to the attention of the Standards Council for approval as the policy of ASA. This resolution follows:

"RESOLVED that in order to be suitable for approval by the American Standards Association, a standard shall be sufficiently definite and conclusive to form a criterion by which one skilled in the art may determine whether material, work, product, process, procedure, operation, or usage conforms to the standard."

The report of the committee and its recommendations were made to the Standards Council on June 1, 1956, and were accepted by the Council with approval of all actions indicated in the foregoing discussion.

It is evident that this action, if approved by the Board of Directors, would clarify the scope of activities of the American Standards Association and place it in a position to promulgate any standard that deserves national recognition whether in the fields of engineering, accounting, business practice, or consumer goods, but not necessarily exclusively in these fields.

This would be further strengthened by the right of any Member-Body of the American Standards Association to object to any specific proposal which it believes is not suitable in scope or content for approval as American Standard. Finally, the doctrine stated in the resolution above would provide an effective criterion for judging whether a standard is suitable for approval as American Standard.

It is believed that the foregoing sincerely sets forth, as of the present time, the policy and scope of the American Standards Association.

The policy and scope, as approved by the Standards Council, were presented to the ASA Board of Directors for preliminary consideration on June 12, 1956. They will be formally acted upon by the Board at its meeting on September 10, 1956.

Paine to Join AATCC as Executive Secretary

George P. Paine has been appointed to the new post of Executive Secretary and Assistant Treasurer of the American Association of Textile Chemists and Colorists, one of the leading textile associations in the United States. His appointment was confirmed at the June 15 meeting of the AATCC Council, governing body of the association.

Mr Paine, now Assistant Secretary and Director of Public Relations of the American Standards Association, will take office about September 1. He has been with ASA 10 years following his wartime service in the Navy. He is now a Naval Reserve commander.

His responsibilities have included membership development, membership services, supervision of publicity, and direction of ASA's public relations activities.

He has directed ASA's national conferences on standards and has been secretary of the Conference of Executives of Organization Members (CEOM) of ASA for the last eight years.

Mr Paine was alternate United States delegate to the first meeting of the Council of the International Organization for Standardization (ISO) in Zurich in 1947. In 1952 he organized the Second Plenary Session of the ISO, held in New York, and two years later served as Executive Officer of the 1000-delegate Golden Jubilee meeting of the International Electrotechnical Commission convening in Philadelphia. He is secretary of the International Day Committee of the Perkin Centennial.

American Viscose Uses L22 Standards

FINISHED RAYON STAPLE, to be packed in bales and shipped to spinning mills.

SOME $2,000,000 in advertising and promotion is being placed this year behind the use of American Standards L22 by the American Viscose Corporation. The Corporation has officially adopted the American Standards as minimum requirements for end-use products made of its fibers.

Under its program, American Viscose will license users of its fibers to permit application of the "Avisco Integrity" label stating that products meet or exceed the requirements of the L22 standards. The company will police the use of the label through all the operations that go into making the finished product for consumer sale.

The American Standards L22 establish the basic minimum requirements for rayon and acetate and mixed fabrics in terms of their end use for men's wear, women's wear, and home furnishings, and include tests to determine washability, strength, colorfastness, and other characteristics.

Customers may expect to see the Avisco Integrity Tag, with reference to American Standards L22, on wearing apparel and household articles, Harry L. Dalton, vice-chairman of American Viscose Corporation, announced June 19. In the apparel field, the Integrity Tag will tell whether the garment is washable, machine washable at hand temperature, or dry cleanable. The National Retail Dry Goods Association, which sponsors the American Standards L22, will inform its member stores of the plan, it was announced.

American Viscose Corporation already has licensed 34 converters and 17 finishers under the integrity program. As an illustration of the effectiveness of the policing, the company announced it has had to withdraw licenses from several producers because they failed to maintain the quality standards set under the L22 standards.

The L22 standards are based on requirements set up originally by the American Viscose Corporation under its "Crown Tested Plan," Mr Dalton pointed out. The Corporation gave its testing data and specifications to the National Retail Dry Goods Association and the American Standards Association for use in preparing American Standards on rayon and acetate fabrics. A broadly representative committee, organized under the procedure of ASA and sponsored by NRDGA, developed the American Standard Minimum Requirements for Rayon and Acetate Fabrics, L22.

In announcing adoption of the L22 standards in connection with their "Avisco" program, Mr Dalton said, "We intend this to be a continuous quality program. It is not enough that a fabric passes the lab tests once. We follow through with regular checking thereafter and will withdraw our label if standards are not met."

Arthur Wachter, converter relations department, American Viscose Corporation, explained the operation of the plan. When the converter fills out a form for the dyeing and finishing of the fabric, American Viscose gets a copy. The dyer sends samples of every dye lot, which is tested for the L22 requirements. If requirements are met, tags are issued to the garment manufacturer (not the converter). Any of the fabric can be checked back to the original dye order.

A hang tag is now being used as the "Avisco Integrity" label, but it is hoped that ultimately permanent labels may be used, the Company declared.

Early this year, THE MAGAZINE OF STANDARDS announced adoption of the L22 American Standards by Reeves Brothers, Bishopville Division, as the basis for the Reeves Quality-Labeling system. Percy R. Meeker, vice-president of the Bishopville division, took occasion to comment on his company's experience with the standards in connection with announcement of the American Viscose Corporation's labeling plan. Since adoption of the standards, Mr Meeker said, "not a single consumer complaint has been received on any fabric sold under the labeling code." "This is particularly noteworthy," he commented, "in an industry that's usually flooded with complaints."

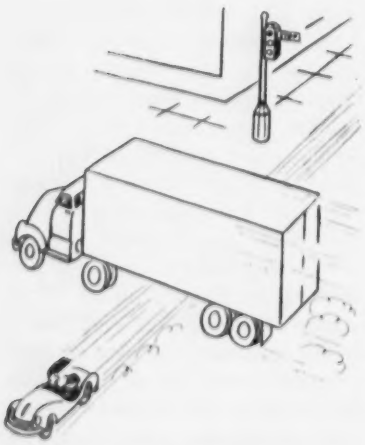
Sontheimer and Haeusler Elected by Highway Standards Board

Bachrach

G. D. Sontheimer

Roy C. Haeusler

New officers have been elected by the Highway Traffic Standards Board, which is in charge of all work done under the procedure of the American Standards Association having to do with traffic and highway problems. Most recent action of the Board was to study a suggestion for safety standards for automobile seat belts. After holding a number of meetings with groups concerned, the Board came to the conclusion that there is no consensus at the present time in favor of development of such standards.



"Whew, that was close!"

From Travelers' Fatal Fallacies.

G. D. Sontheimer, Director of the Department of Safety, American Trucking Associations, Inc, was named chairman of the Board at an election in June. Roy C. Haeusler, Automotive Safety Engineer of the Chrysler Corporation, was elected vice-chairman.

Mr Sontheimer has had 20 years experience in traffic safety work, an increasingly complex problem because of the steady rise in the number of vehicles on the highways and on city streets. He often serves with local or state committees, and, during a year's time, makes a large number of radio and television appearances and speeches on safety matters.

He joined ATA in 1947 after having served as a member of the Missouri State Highway Patrol and as Safety Inspector for the Bureau of Motor Carriers of the Interstate Commerce Commission. This experience included setting up state-wide safety campaigns. During his service with ICC he assisted in the organization and served as vice-chairman of the Arkansas State Safety Council.

Mr Sontheimer now represents ATA in all its contacts with national organizations interested in traffic safety. He is a member of the Technical Advisory Committee of the White House Safety Conference; the Traffic and Transportation Conference of the National Safety Council; and the National Advisory Committee on Fleet Supervisor Training. He is chairman of the Committee on Fleet Program Standards of the National Advisory Committee, which develops the subjects taught in training schools.

Mr Haeusler had experience as a machine builder before joining the staff of the Carburetor Laboratory of Chrysler's Engineering Division in 1937. In 1948 he transferred to the Experimental Section. Among his projects was analysis of the Russian T-34 tank. He became a project engineer in turret controls in the Ordnance Development Section during 1950, and eventually was given charge of all tank-component engineers. In October 1954 he became a Chrysler Liaison Engineer to the U.S. Army Ordnance Corps.

Mr Haeusler was appointed to Chrysler's newly created position of Automotive Safety Engineer in 1955. Here he has responsibility for coordinating all aspects of automotive vehicle safety. He serves as the Chrysler Corporation representative on safety committees in the National Safety Council, the Automotive Manufacturers Association, and the Society of Automotive Engineers, among others. He is a member of the Army Ordnance Association and the Society of Automotive Engineers.

Leonard G. Haeger

FRED M. HAUSERMAN (above, right), H. B. Zackrison (below, at left), and Leonard G. Haeger received the ASA Modular Measure Award at the Spring Luncheon of The Producers' Council. C. W. Kraft, shown presenting the aluminum award module, was an award recipient in 1954.

Service to MODULAR MEASURE Recognized

Outstanding service in advancement of Modular Measure as a means of benefiting the national economy was recognized at the Spring Luncheon of The Producers' Council at Los Angeles May 14. The ASA Modular Measure Award was presented to Leonard G. Haeger, technical director, Levitt & Sons, Inc; Fred M. Hauserman, president, the E. F. Hauserman Company, Cleveland; and H. B. Zackrison, chief, Engineering Department, U.S. Army Corps of Engineers, Gravelly Point, Virginia.

C. W. Kraft, president, Kraftile Company, Niles, California, presented the especially designed aluminum "modules" on behalf of the American Standards Association. The "modules" were provided by courtesy of ALCOA. The Producers' Council, the American Institute of Architects, the National Association of Home Builders, and now the Associated General Contractors of America are sponsors of Project A62, Coordination of Dimensions of Building Materials and Equipment (known more generally as "Modular Measure").

Mr Haeger received the award for his encouragement of adoption of Modular Measure by governmental agencies, as well as the construction industry, particularly in the field of housing.

Mr Hauserman was cited for "his generous and continuing material support and personal services."

The award to Mr Zackrison pointed out "his sympathetic appraisal of its advantages and his cooperation in its application to government-owned structures."

ASA's EXHIBIT at the Inform-a Show of the National Association of Purchasing Agents, Cleveland, Ohio, May 20-23. Standards are ready-made tools that help keep companies in the black, the exhibit pointed out. Purchasing agents were urged to use standards as the key to better management for greater profit.

Reducing Costs Through Purchasing

"Where there has been large-scale production of standardized products and we have used plenty of capital in latest plant, tools, and equipment, we have been pretty well able to keep costs down and prices under control," H. Thomas Hallowell, Jr, president, Standard Pressed Steel Company, told the National Association of Purchasing Agents at its meeting, May 22. Mr Hallowell is president of the American Standards Association.

Small lots of special items are not produced economically by any supplier, Mr Hallowell pointed out. Informed suppliers price their standard items at such a low price as not to bring undue competition into the field, he said, and progressive companies keep costs and prices and profits on standard items separate from those of nonstandard items.

Explaining why this should be done, Mr Hallowell said:

"Throwing a volume of good, standard peaches into the same basket with a few nonstandard lemons can make such a formidable brew that its effects can be extremely corrosive to a company's profits. For example:

$1000	Sale of standard high-production stock items (peaches)
900	Costs
$ 100	Profits
$ 150	Cost of a nonstandard short lot special (lemons)
50	Sales price
$ 100	Loss

"On a combined sale of $1,050 of standard peaches and nonstandard lemons, the profit can be $000. However, if we eliminate the lemons, the profit goes back to 10 percent—or by increasing the price of the lemons even three times (just breaking even on the special) the profit on the entire transaction would be 9½ percent."

Mr Hallowell urged purchasing agents to educate top management as to the importance of standards in today's industrial economy. "Too many chairmen, presidents, and vice-presidents still look upon standardization simply as a technical function of production," he said.

"Standardization today is a true management function that should not be completely delegated to others because some of our greatest future areas of cost reduction with corresponding increases in profits lie in the area of more development and use of American Standards," he declared.

NEWS BRIEFS.....

• A Committee on Sampling Procedures has been authorized by the Canadian Standards Association to guide technical committees and Canadian industry in providing efficient sampling procedures in inspection and test specifications. One of the committee's purposes is to bring Canadian standardization work more into line with that of ASA and ASTM committees. The first meeting was held early this year.

The committee's scope is:

1. To act in a consultative way with other committees on questions relating to sampling or quality control procedures, and advise regarding inclusion of such information in published matter.

2. To look into the broad question of the desirability of inclusion of sampling methods in descriptive specifications, or the preparation of separate "inspection instructions."

3. To review the present situation in the United States with reference to those questions, as covered by the work of ASA and ASTM committees, with a view to bringing Canadian standardization work into line.

Plans have been made to acquaint CSA committees with principles of acceptance sampling, with particular reference to "fallacies in popular notions concerning good sampling practice," the committee reports. Particular stress is to be laid on the inability of a small number of observations or tests to predict with sufficient accuracy the character of the whole of the process or material being investigated.

• The ISO system of transliteration of cyrillic characters (ISO Recommendation 9) has been adopted by Unesco for its bibliographical publications, and by the Unesco Library for its catalogs.

This announcement is made by Francis L. Kent, Librarian of the Unesco Library at Paris, France, in an article discussing the new ISO Recommendation, *Unesco Bulletin for Libraries,* May-June (page 132).

The ISO Recommendation is the first internationally-agreed transliteration system and as such it has an importance apart from its content, Mr Kent declares.

"If diversity of language forms one of the principal barriers to international understanding, this barrier is powerfully reinforced by diversity of scripts," he explains. "A complicating factor is the fact that of all the scripts in use in the world today few are adequate to represent the sounds of the languages for which they are used."

ISO Technical Committee 46 has other transliteration work under study. A first draft on modern Greek was prepared in 1954 by the French Standards Association for study by the national member bodies of the committee, and appropriate member bodies have been asked to make preliminary schemes for certain Asian scripts. In addition, the Indian Library Association is making a study of the standardization of Asian names in bibliographies. This study is being made under contract with Unesco.

Gaillard Seminars

Sixteen men representing fifteen organizations attended the Gaillard Seminar on Industrial Standardization in New York City, June 18 through 22, 1956. The organizations are:

American Standards Association
*Arma Division, American Bosch Arma Corp.
Bucyrus-Erie Co.
Collins Radio Co., Western Division
*Convair, A Division of General Dynamics Corp.
Dominion Engineering Works Ltd. (Canada)
Falk Corp.
*Foxboro Co.
*A. W. Haydon Co., Division of Consolidated Electronics Industries Corp.
*Ingersoll-Rand Co.
International Business Machines Corp.
Koppers Co., Inc.
*Manning, Maxwell & Moore, Inc.
Standard Pressed Steel Co.
*Whirlpool-Seeger Corp.

The seven organizations marked by an asterisk were represented for the first time.

The Gaillard Seminar, held in New York City twice a year since 1947, was created to assist companies in getting the full benefit of using standards through establishment of effective organization and procedure for developing, introducing, maintaining and progressively revising standards needed by each enterprise to operate harmoniously as a unit, improve managerial control, and reduce cost. A total of more than three-hundred men representing 174 organizations have so far attended the New York sessions.

Also, some of the companies represented have already availed themselves of the opportunity to have a Private Company Seminar held at their headquarters. This new service to industry was announced in the March issue of THE MAGAZINE OF STANDARDS (page 90).

The next Gaillard Seminar in New York will be held from January 21 through 25, 1957, in the Engineering Societies Building. A private company seminar may be held, by special arrangement, at a time and place convenient to the sponsor company.

Arrangements for either type of seminar may be made by writing to Dr John Gaillard, Management Counsel, at his new address: Box 273, Route 1, Briarcliff Manor, N.Y.

FROM OTHER COUNTRIES

Members of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Orders may also be sent to the country of origin through the ASA office. Titles are given here in English, but documents are in the language of the country from which they were received. An asterisk * indicates that the standard is available in English as well. For the convenience of readers, the standards are listed under their general UDC classifications. In ordering copies of standards, please refer to the number following the title.

017/019 CATALOGS

France (AFNOR)

Rules for choosing main entries for alphabetical catalogs of authors and anonymous NF Z 44-060

389 METROLOGY. WEIGHTS AND MEASURES. STANDARDIZATION

Israel (SII)

Conversion factors of units SI 151

536.5 TEMPERATURE MEASUREMENT

United Kingdom (BSI)

Reference thermometers for field use BS 2736:1956

542 EXPERIMENTAL CHEMISTRY

Germany (DNA)

Tiles for chemical laboratory tables DIN 12912

United Kingdom (BSI)

Rees-Hugill powder-density flask BS 2701:1956

Boiling flasks (narrow-necked) conical, flat bottom and round bottom BS 2734:1956

Iodine flasks BS 2735:1956

614.8 PREVENTION OF ACCIDENTS. SAFETY MEASURES

United Kingdom (BSI)

Protective clothing for welders BS 2653:1955

Spain (IRATRA)

Mounting railway car springs UNE 25077

Lantern and flag holders UNE 25094/5

Ashtrays in smoking cars UNE 25096

Sign holders UNE 25099

615.4 PRACTICAL PHARMACY

Germany (DNA)

3 stds for different gauze dressing DIN 13151/3

615.47 SURGICAL AND MEDICAL INSTRUMENTS AND APPLIANCES

United Kingdom (BSI)

Tagged boot and shoe laces (cotton) BS 1801:1956

Dimensions of condenser rubbing leathers BS 2716:1956

Cotton tickings for hospitals and local authorities BS 2732:1956

Natural rubber stomach tubes BS 2731:1956

Sweden (SIS)

Hospital beds, types A, B, C, D CSB 351/4

Children's hospital beds CSB 355/7

620.1 TESTING MATERIALS

France (AFNOR)

Mechanical testing of materials. Terminology FD X 10-011

United Kingdom (BSI)

Reference blocks for routine checking of ultrasonic testing equipment BS 2704:1956

621.3 ELECTRICAL ENGINEERING

United Kingdom (BSI)

Contactors when supplied separately or in combination with other gear BS 775:1956

Electrical performance of semiconductor rectifiers (metal rectifiers) BS 2709:1956

Intrinsically safe magneto-call telephones primarily for use in coal mines BS 2733:1956

Preferred standard ratings and general characteristics for 3000 rev/min, 3-phase 50 c/s turbo-generator sets BS 2730:1956

Australia (SAA)

SAA approval and test specification for appliance plugs and appliance inlet-sockets (formerly known as apparatus connectors) AS C.109-1955 Ap

Austria (ONA)

Insulators series VK for overhead lines ÖNORM E 4115/6

Insulators series K for overhead lines ÖNORM E 4102

Insulator series L for overhead lines ÖNORM E 4118

Classification of high-voltage insulators for overhead lines ÖNORM E 4119

Canada (CSA)

Construction and test of flexible cords and fixture wires CSA C22.2 No. 49-1956

Specifications for enamelled round copper magnet wire CSA C84.1-1956

Specifications for vinyl acetal insulated magnet wire CSA C84.2-1956

Finland (SFS)

2 stds for electrical kitchen stoves SFS C.III.1 and C.III.4

Electrical grill boilers SFS C.III.2

5 stds for electrical conduits and fittings SFS C.V.39/43

Israel (SII)

Methods of testing electrical material SI 165

Plastic connection boxes for "antigron" cables SI 164

Electric wiring regulations: lighting fittings and their control appliances SI 108 (sec. 501)

Netherlands (HCNN)

Copper twist sockets for overhead lines V 1120

Paper twist sockets V 1121

Copper twist sockets for conductors V 1328

Wood poles, anchors, shores and cross-beams for overhead lines V 1331

Branch terminals for one or two branch cords. Jaw-clamp V 2131

United Kingdom (BSI)

Electricity meters—Part 6: Direct current two-wire mercury motor credit-type meters BS 37:Part 6:1956

Tungsten filament general service electric lamps (200-250V) BS 161:1956

Non-ferrous conduit and conduit fittings (aluminum and zinc alloy) BS 2706:1956

Memorandum on the measurement of cooling-medium temperature BS 2725:1956

Use of electronic valves: Part 3: Photocells transmitting valves and cold-cathode gas-filled valves BS CP 1005:Part 3:1956

Class 1—Metal-arc welding of steel pipelines and pipe assemblies for carrying fluids BS 2633:1956

General requirements for the metal-arc welding of medium tensile weldable structural steel to BS 968, type a BS 2642:1955

Tests for use in the approval of welders—Part 1: Manual metal-arc and oxy-acetylene welding of mild steel and low alloy steel sheets, plates and sections BS 2645:Part 1:1955

621.64 DEVICES FOR CONVEYANCE AND STORAGE OF GASES AND LIQUIDS

Bulgaria

Steel barrels for fuel and oil transportation BDS 79

Israel (SII)

Asbestos-cement non-pressure pipes SI 156

621.7 WORKSHOP PRACTICE

Netherlands (HCNN)

Metal coating. Metalization V 3091

621.791 WELDING, SOLDERING, CUTTING

Australia (SAA)

Covered electrodes for metal arc welding of carbon steel AS B.28-1955

Classification of covered electrodes AS B.130-1955

Belgium (IBN)

Test for prevention of explosion in hydraulic valves of oxy-acetylene equipment for welding. Supplement to: NBN 176

621.82/.85 TRANSMISSION PARTS

Germany (DNA)

Ceiling-type pillow blocks DIN 119

United Kingdom (BSI)

Shaft coupling flanges BS 2715:1956

621.82 BEARINGS, COUPLINGS, JOURNALS, ETC

Spain (IRATRA)

Sprocket wheel for roller chains UNE 18011

621.86/.87 HOISTING AND CONVEYING MACHINERY

France (AFNOR)

Recommended hand signs for operating hoisting machines NFD E 52-401

Hungary (MSZH)

Sling type brick lifting devices MNOSZ 16706
Excavators and building cranes MNOSZ 16760

Sweden (SIS)

Pallets and stapling box SIS 712012

621.89 LUBRICATION

Austria (ONA)

Lubricating oils for internal combustion engines ÖNORM C 2014

Germany (DNA)

Lubricating oil for refrigerating machines DIN 51503
Testing of lubricants: determination of ionizable chlorine content DIN 51800
Standard lubricating oils. Rules for using DIN 51509

Israel (SII)

Lubricating oil for automobile motors SI 152

621.9 MACHINE TOOLS. TOOLS

Austria (ONA)

Surface finish ÖNORM M 1115, Part 2

Germany (DNA)

Sieves with textile netting DIN 4195, Bl.1

Netherlands (HCNN)

Milling cutters, saws, grinding stones, outside diameters V 1321

United Kingdom (BSI)

Rack type gear cutters BS 2697:1956

622 MINING

France (AFNOR)

20 stds for compressed air pipes and fittings for mines NF M 82230/2, -235, 237/40, -242, -245, 250/2, 252/260
Round screw thread for compressed air pipeline couplings, tolerances NF M 82-265
Gas pipe thread for compressed air pipeline couplings, tolerances NF M 82-267

Japan (JISC)

4 stds for mining crushers JIS M 4101/4 *
3 stds for mining mills JIS M 4105/7 *
Bucket elevator for coal washing JIS M 4601 *
Steel tub used in metal and coal mines JIS M 6501 *

Poland

2 stds for classification of coal PN G-97002/3
Rules for storing coal PN G-07010

625.1/.6 RAILWAYS AND TRAMWAYS

France (AFNOR)

Methods of attachment of mirrors NF F 31-009
Standard width of track NF F 50-402
Metric width of track NF F 50-701
Drift hammers NF F 76-012

625.2 RAILWAY ROLLING STOCK

Bulgaria

15 stds for different parts for coupling and braking mechanism of railway cars (bound together with 10 stds for ship building details: see UDC 629.12) BDS 1522, 1534, 1630, 1633/5, 1664, 1691, 1787, 1796/7, 1809, 1893, 1936, 1999

Japan (JISC)

Coupling for air-brake hose JIS E 4302

628.1 WATER FOR TOWNS AND VILLAGES

Israel (SII)

Sampling during water well drilling SI 160

629.13 AIRCRAFT ENGINEERING

Spain (IRATRA)

Different terms pertaining to airborn airplane UNE 28002, h 3
Different terms pertaining to airplane on ground UNE 28002, h 4

632 PHYTOPATHOLOGY

France (AFNOR)

Pest control chemicals. Terminology NF U 43-000

Israel (SII)

BHC, technical IS 560-1955
BHC dusting powders IS 561-1955
BHC water dispersible powder concentrates IS 562-1955
DDT, technical IS 563-1955
DDT dusting powders IS 564-1955
DDT water dispersible concentrates IS 565-1955

667.0/.3 TREATMENT OF FIBRES AND TEXTILES

Austria (ONA)

Testing for flammability resistance of material used in making oilcloth ÖNORM C 2306

Denmark (DS)

Wash methods for knitted fabrics used for control of sizes DS 924
8 stds for the determination of colorfastness:
—general principles DS 930
—to water DS 931
—to water spotting DS 932
—to sea water DS 933
—to organic solvents DS 934
—to rubbing DS 935
—to washing DS 936
—to hot pressing DS 937

667.4/.5 INKS

Israel (SII)

Writing ink on iron basis SI 151

United Kingdom (BSI)

Marking inks BS 2726-9:1956

Ray Conner Retires

Raymond M. Conner, Consultant for the American Gas Association Laboratories, retired July 31, after 41 years of distinguished service to the American gas industry and more than 25 years service to ASA Sectional Committee Z21.

"Mr Conner has contributed more to the growth of national standards for gas appliances and accessories and to the success of the gas industry's 'national gas appliance testing agency' than any other living individual," the Association says.

Mr Conner became Director of the Laboratories of the American Gas Association in 1925 at the time they were established to assist in formulating nationally recognized safety standards for gas appliances and in granting approval to those new appliance designs which were found by testing to comply with the standards.

The success of his administration of the Laboratories is reflected in their rapid growth, and in the fact that the Laboratories' policies and procedures established during the early years have required little change during the Laboratories' history.

The original staff of four, housed in rented quarters in 1925, has increased to nearly 210, and the AGA Laboratories represent an investment of over $1,500,000 in buildings and equipment.

In addition to his responsibility as Director of Laboratories, Mr Conner was also appointed secretary of the Association's Approval Requirements Committee immediately following its organization in 1925. This group became Sectional Committee Z21 of the American Standards Association in 1930.

As secretary of Sectional Committee Z21, much of the investigational and administrative work required for the preparation of the standards rested on Mr Conner and the Laboratories' staff. Today, these standards are the cornerstone of the industry's appliance approval program.

After more than 22 years as Director of the Laboratories, and as secretary of the Approval Requirements Committee, illness in 1947 required Mr Conner to relinquish active participation. However, because of his intimate knowledge of the Laboratories' policies and procedures, and his wide knowledge of the gas industry, he continued his services as the Laboratories' Consultant until his retirement.

BOOKS.....

Heating Ventilating Air Conditioning Guide 1956 *Thirty-fourth edition. 6 x 9. Cloth bound. American Society of Heating and Air-Conditioning Engineers, 62 Worth Street, New York 13, N. Y.* $12.00

Particular attention is given in this new edition to presentation of heat transmission coefficients of building materials. Design values for conductivity and conductance are included for many more materials than in previous Guides. The 53 chapters of technical data (1,176 pages) are grouped under seven sections: I, Fundamentals; II, Human Reactions; III, Heating and Cooling Loads; IV, Combustion and Consumption of Fuels; V, Systems and Equipment; VI, Special Systems; and VII, Instruments and Codes.

Material concerning the products of 335 manufacturers is given in the Catalog Data Section.

The 24 x 32-inch ASHAE Psychrometric Chart is also included.

Edge indexes are an aid in referring to the Technical and Catalog Data Sections.

Book of ASTM Standards, 1955. *6 x 9. 11,000 pp. In seven parts. Part 1, Ferrous Metals, 1834 pp.* $13.50; *Part 2, Non-Ferrous Metals, 1516 pp.* $11.00; *Part 3, Cement, Concrete, Ceramics, Thermal Insulation, Road Materials, Waterproofing and Soils, 2062 pp.* $13.50; *Part 4, Paint, Naval Stores, Wood Cellulose, Wax Polishes, Sandwich Building Constructions, 1416 pp.* $11.00; *Part 5, Fuels, Petroleum, Aromatic Hydrocarbons, and Engine Antifreezes, 1496 pp.* $11.00; *Part 6, Electrical Insulation, Electronic Materials, Plastics and Rubber, 1776 pp.* $13.00; *Part 7, Textiles, Soap, Water, Paper, Adhesives, and Shipping Containers, 1692 pp.* $11.00. *Complete Set* $84.00. *American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa.*

More than 2150 standard specifications, tests, and definitions for materials are included in this triennial *Book of ASTM Standards*. Each Part is complete with a detailed subject index and a list of standards in numeric sequence. Since the 1952 edition, 1158 standards are new or have been revised.

To keep the Book up to date, supplements will be issued to each Part late in 1956 and late in 1957. A complete Index is furnished without charge with each set of the *Book of ASTM Standards*.

International Electrotechnical Vocabulary. Group 11, Static Convertors. *Second edition. 36 pp. 8 x 13. 1956. International Electrotechnical Commission, Geneva, Switzerland (Under the patronage and with the financial assistance of the United Nations Educational, Scientific and Cultural Organization). Copies available from the American Standards Association, 70 E. 45 Street, New York 17, N. Y.* $2.00.

This is one of a series of booklets, each of which comprises one section or "group" of the second edition of the International Electrotechnical Vocabulary. It contains some 110 terms and definitions dealing with static convertors, under the following headings: General terms; gas-filled rectifiers; mercury-arc rectifiers and their components; circuits and operating conditions; miscellaneous convertor components.

Terms and definitions are given in English and French. The terms without definitions are listed in Dutch, German, Italian, Polish, Spanish, and Swedish. There is an alphabetical index of the terms in each of these eight languages.

Report on IEC Work on Standard Dimensions for Electric Motors, Publication 72. 1956. *Second edition. In French and English. 12 pp. 8 x 13. International Electrotechnical Commission, Geneva, Switzerland (Available from the American Standards Association, 70 E. 45 Street, New York 17, N. Y.).* $1.20.

In this new edition, a table of preferred output ratings for electric motors has been added, and data on eight extra frame sizes included. The report contains two series of frame sizes of motors, one based on millimeter dimensions and the other on inch dimensions. The report represents a statement of progress on work commenced in 1950.

Recommendations for Ballasts for Fluorescent Lamps, IEC Publication 82. 1956 *First edition. 44 pp. Heavy paper cover. International Electrotechnical Commission, 1, rue de Varembe, Geneva, Switzerland. (Copies available from American Standards Association, 70 E. 45 Street, New York 17, N. Y.* $2.40.)

Requirements with which ballasts must comply in order to ensure correct performance of lamp circuits are described in this International Recommendation. Also included are features of reference ballast construction and performance considered necessary to ensure accurate and reproducible results when testing ballasts, particularly with regard to the selection of reference lamps. Definitions, marking, and ballast performance are covered. Four appendices give information on lamp types and characteristics, reference ballasts, reference lamp, and testing.

The Recommendation was prepared by Technical Committee 34 on Lamps and Related Equipment of the International Electrotechnical Commission. The committee is planning to continue its work on auxiliaries for fluorescent lighting.

Calibration of Line Standards of Length and Measuring Tapes at the National Bureau of Standards, *by L. V. Judson, NBS Circular 572, issued June 4, 1956, 11 pages, 15 cents. (Government Printing Office, Washington 25, D.C.)*

An important service of the National Bureau of Standards is the calibration of line standards of length used by Government, science, industry, and commerce. This Circular is a guide for anyone contemplating the submission of such items to the Bureau for standardization.

Mining Standards Board Elects Alford

Newell G. Alford, Consulting Mining Engineer of Pittsburgh, Pa., recently was elected chairman of ASA's Mining Standards Board. Representing the Coal Mining Institute of America, of which he is a past president, he has served for over a decade with the mining board. He has a background in both mine engineering and the business end of coal operation.

Born in Philadelphia, and a Quaker, Mr Alford had his preparatory education at Friends Central School. He was graduated from Swarthmore College in 1909 and later received the E.M. degree from the University of Pittsburgh. He had his first taste of coal mining during college vacations on the mine corps of U. S. Coal & Coke Company, Gary, W. Va.

On graduation he worked first at the by-product ovens of the Illinois Steel Company at Joliet, Ill., then for the St Bernard Mining Company, where he was successively assistant chief engineer, chief engineer, and assistant to the president.

His work was both underground and on the surface in mine surveys and projection, plant construction, prospecting, and reports on new and active properties. Working with mines, he started regular inspections, began the accident prevent program, and finally assumed the direction of mine operations and labor relations.

Since 1920 when he joined the late Howard Eavenson in a new consulting firm, he has been in consulting work in Pittsburgh. There he has become recognized for his work in property appraisal, mine development, interpretation of prospecting, and analyses of possible potential earnings.

In 1923, with Mr Eavenson, he organized and installed the Clover Splint Coal Company in Harlan County, Kentucky, opening a new boundary of premium coal, the result of his prospecting search through the eastern Kentucky fields. Mr Alford was one of the principal owners of this company and served it as general manager, treasurer, and director. Connected with the sale of this company's coal, he was one of the organizers and treasurer of the Holston Corporation, which controlled and operated a chain of retail coal yards from Georgia to western Iowa.

Mr Alford has been active in the American Institute of Mining and Metallurgical Engineers since before the organization of its Coal Division in 1930. He served as Coal Division Chairman in 1942. In 1937 he organized the Division's Committee for Coal Mining Engineering Education. He was a director of AIME from 1949 to 1951.

Among his other activities, Mr Alford served as Associate Editor of the *Mining Congress Journal* in the 1920's; he is a member of the Mine Rescue Veterans Association; a member of many engineering societies; and author of technical papers and brochures on mining and mine economics.

The other officers of the Mining Standards Board are M. D. Cooper, Director of Mining Engineering Education, National Coal Association, Pittsburgh, vice-chairman for Coal; E. R. Borcherdt, Research Engineer, Anaconda Copper Mining Company, Butte, Montana, vice-chairman for Metal; and F. C. Frost, American Standards Association, secretary.

Maryland Adopts Z49

The Department of Labor of the State of Maryland has recently adopted Safety in Electric and Gas Welding and Cutting Operations as regulations with the force and effect of law, governing welding operations. This publication is American Standard Z49.1-1950, prepared by a sectional committee under the sponsorship of the American Welding Society and approved by the American Standards Association.

In commenting on this, Joseph A. Haller, Director of Safety of the Maryland Department of Labor and Industry, stated: "Our Safety Advisory Board felt that this was an excellent standard and recommended its adoption to the Commissioner of the Department of Labor and Industry." Continuing, Mr. Haller stated: "We have felt for some time that it is better to adopt standards or codes national in scope than it is to compile codes of our own. Standards, approved by the American Standards Association, meet our requirements very well in this respect and a total of 34 such standards have been adopted and issued for use in Maryland. Also American Standards, prepared by a Committee of experts representing all interested parties, carry more weight in obtaining compliance than regulations arbitrarily issued by a regulatory department of the government."

AMERICAN STANDARDS UNDER WAY

Status as of July 24, 1956

BUILDING AND CONSTRUCTION

American Standards Published—

Drain Tile, Specifications for, ASTM C 4-55; ASA A6.1-1956 (Revision of ASTM C 4-50T; ASA A6.1-1954) $.30

Gypsum Plasters, Specifications for, ASTM C 28-55; ASA A49.3-1956 (Revision of ASTM C 28-50; ASA A49.3-1951) $.30

Gypsum Wallboard, Specifications for, ASTM C 36-55; ASA A69.1-1956 (Revision of ASTM C 36-54; ASA A69.1-1955) $.30

Structural Clay Load-Bearing Wall Tile, Specifications for, ASTM C 34-55; ASA A74.1-1956 (Revision of ASTM C 34-52; ASA A74.1-1953) $.30

Concrete Building Brick, Specifications for, ASTM C 55-55; ASA A75.1-1956 (Revision of ASTM C 55-52; ASA A75.1-1953) $.30

Concrete Masonry Units, Methods of Sampling and Testing, ASTM C 140-55; ASA A84.1-1956 (Revision of ASTM C 140-52; ASA A84.1-1953) $.30

Vitrified Clay Filter Block for Trickling Filters, ASTM C 159-55; ASA A102.1-1956 (Revision of ASTM C 159-51; ASA A102.1-1954) $.30

Definitions of Terms Relating to Structural Clay Tile, ASTM C 43-55; ASA A104.1-1956 (Revision of ASTM C 43-50; ASA A104.1-1954) $.30
Sponsor: American Society for Testing Materials

American Standard Approved

Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units (Revision of ASTM C 126-52T; ASA A101.1-1954) ASTM C 126-55T; ASA A101.1-1956
Sponsor: American Society for Testing Materials

In Standards Board

Fire Tests of Building Construction and Materials, Methods of, ASTM E 119-55; ASA A2.1 (Revision of ASTM E 119-41; ASA A2.1-1942)

Fire Tests of Door Assemblies, Methods of, ASTM E 152-55T; ASA A2.2 (Revision of ASTM E 152-41; ASA A2.2-1942)

Test for Combustible Properties of Treated Wood by the Fire Tube Test Method, Method of, ASTM E 69-50; ASA A 2.3

Test for Combustible Properties of Treated Wood by the Crib Test Method, Method of, ASTM E 160-50; ASA A2.4
Sponsors: American Society for Testing Materials; National Bureau of Standards; National Fire Protection Association

Billet-Steel Bars for Concrete Reinforcement, ASTM A 15-54T; ASA A50.1 (Revision of ASTM A 15-39; ASA A50.1-1939)

Legend

Standards Council—Approval of Standards Council is final approval as American Standard; usually requires 4 weeks.

Board of Review—Acts for Standards Council and gives final approval as American Standard; action usually requires 2 weeks.

Standards Board—Approve standards to send to Standards Council or Board of Review for final action; approval by standards board usually takes 4 weeks.

Rail-Steel Bars for Concrete Reinforcement, Specifications for, ASTM A 16-54T; ASA A50.2 (Revision of ASTM A 16-35; ASA A50.2-1936)

Structural Rivet Steel, Specifications for, ASTM A 141-55; ASA G21.1

Steel for Bridges and Building, Specifications for, ASTM A 7-55T; ASA G24.1

Structural Silicon Steel, Specifications for, ASTM A 94-54; ASA G41.1

High-Strength Structural Rivet Steel, Specifications for, ASTM A 195-52T; ASA G42.1

Axle-Steel Bars for Concrete Reinforcement, Specifications for, ASTM A 160-54T; ASA G43.1

High-Strength Steel Castings for Structural Purposes, Specifications for, ASTM A 148-55; ASA G52.1
Sponsor: American Society for Testing Materials

CONSUMER GOODS

In Board of Review

Milled Toilet Soap, Specifications for (Revision of ASTM D 455-53T; ASA K60.6-1954)
Sponsor: American Society for Testing Materials

Withdrawal Being Considered

Code for Testing Domestic Refrigerators Using Ice, ASA B38cl-1931
Sponsor: American Society of Refrigerating Engineers

ELECTRIC AND ELECTRONIC

American Standard Published

Safety for Wire Connectors and Soldering Lugs, UL 486; ASA C 33.5-1956 $.75
Sponsor: Underwriters' Laboratories

American Standards Approved

Bronze Trolley Wire, Specifications for, ASTM B 9-55; ASA C 7.5-1956 (Revision of ASTM B 9-52; ASA C7.5-1953)

Copper Trolley Wire, Specifications for, ASTM B 47-55; ASA C7.6-1956 (Revision of ASTM B47-52; ASA C7.6-1953)

Soft Rectangular and Square Bare Copper Wire for Electrical Conductors, Specifications for, ASTM B 48-55; ASA C7.9-1956 (Revision of ASTM B 48-52; ASA C7.9-1953)

Hard-Drawn Coper Alloy Wires for Electrical Conductors, Specifications for, ASTM B 105-55; ASA C7.10-1956 (Revision of ASTM B 105-53; ASA C7.10-1953)

Figure-9 Deep-Section Grooved and Figure-8 Copper Trolley Wire for Industrial Haulage, Specifications for, ASTM B 116-55; ASA C7.11-1956 (Revision of ASTM B 116-52; ASA C7.11-1953)

Hard-Drawn Aluminum Wire for Electrical Purposes, Specifications for, ASTM B 230-55T; ASA C7.20-1956 (Revision of ASTM B 230-53T; ASA C7.20-1953)

Concentric-Lay-Stranded Aluminum Conductors, Hard-Drawn and Three Quarter Hard-Drawn, Specifications for, ASTM B 231-55; ASA C7.21-1956 (Revision of ASTM B 231-53; ASA C7.21-1953)

Concentric-Lay-Stranded Aluminum Conductors, Steel-Reinforced, Specifications for, ASTM B 232-55T; ASA C7.22-1956 (Revision of ASTM B 232-52; ASA C7.22-1953)

Rolled Aluminum Rods (EC Grade) for Electrical Purposes, Specifications for, ASTM B 233-55; ASA C7.23-1956 (Revision of ASTM B 233-52; ASA C7.23-1953)

Standard Weight Zinc-Coated (Galvanized) Steel Core Wire for Aluminum Conductors, Steel Reinforced (ACSR), Specifications for, ASTM B 245-55; ASA C7.28-1956 (Revision of ASTM B 245-52; ASA C7.28-1953)

Zinc-Coated (Galvanized) Steel Core Wire (With Coatings Heavier than Standard Weight) for Aluminum Conductors, Steel Reinforced (ACSR), Specifications for, ASTM B 261-55; ASA C7.34-1956

Three-Quarter Hard Aluminum Wire for Electrical Purposes, Specifications for, ASTM B 262-55; ASA C7.35-1956

Standard Nominal Diameters and Cross-Sectional Areas of AWG Sizes of Solid Round Wires Used as Electrical Conductors, Specifications for, ASTM B 258-51T; ASA C7.36-1956

Laminated Thermosetting Materials, Specifications for (Revision of NEMA LP1-1951; ASA C59.16-1952) ASTM D709-55T; NEMA LP1-1955; ASA C59.16-1956

Vulcanized Fiber Sheets, Rods, and Tubes Used for Electrical Insulation, Specifications for, ASTM D710-54T; ASA C59.29-1956
Sponsor: American Society for Testing Materials

Electric, American Standards

Approved (Continued)—

Requirements, Terminology, and Test Code for Distribution, Power, and Regulating Transformers, and Reactors other than Current-Limiting Reactors, ASA C57.12-1956 (Revision of ASA C57.12-1954, C57.12a-1954, and C57.22-1948, incorporated with C57.-12b-1954)

Sponsor: Electrical Standards Board

In Board of Review

General Service Incandescent Lamps for 115-, 120-, and 125-volt Circuits, C78.100 (Revision of C78.100-1953)

Miniature Incandescent Lamps, C78.140 (Revision of C78.140-1954)

A-25 Bulb, Medium Screw Base, Incandescent Lamps, ASA C78.252

A-23 Bulb, Medium Screw Base, Incandescent Lamps (Overall Length, maximum 6-5/16 in., minimum 5⅞ in.), ASA C78.253

Sponsor: Electrical Standards Board

In Standards Board

Definitions of Semiconductor Terms, IRE 7.S2; ASA C60.14

Sponsor: Joint Electron Tube Engineering Council

Fluorescent Lamp Reference Ballasts, Specification for, ASA C82.3 (Revision of C82.3-1935)

Sponsor: Electrical Standards Board

GAS BURNING APPLIANCES

In Standards Board

Hotel and Restaurant Ranges and Unit Broilers, Approval Requirements for (Revision of Z21.3-1940 and Addenda Z21.3a-1946)

Domestic Gas Clothes Dryers, Approval Requirements for (Revision of Z21.5-1953, and Addenda Z21.5a-1954)

Gas Water Heaters, Approval Requirements for (Revision of Z21.10-1953, and Addenda Z21.10a-1954 and Z21.-10b-1955)

Gas Water Heaters, Volume II, Side-Arm Type Water Heaters Designed for Use with Auxiliary Storage Systems, Approval Requirements for, ASA Z21.10.2

Gas-Fired Room Heaters, Approval Requirements for (Revision of ASA Z21.11-1954 and Addenda Z21.11a-1955)

Central Heating Gas Appliances, Volume I, Steam and Hot Water Boilers, Approval Requirements for (Revision of Z21.13.1-1951 and Addenda Z21.13.1a-1954 and Z21.13.1b-1955)

Central Heating Gas Appliances, Volume II, Gravity and Forced-Air Central Furnaces, Approval Requirements for (Revision of ASA Z21.13.2-1955)

Central Heating Gas Appliances, Volume III, Gravity and Fan Type Floor Furnaces, Approval Requirements for (Revision of ASA Z21.13.3-1951 and Addenda Z21.13.3a-1954 and Z21.13.3b-1955)

Central Heating Gas Appliances, Volume IV, Gravity and Fan Type Vented Recessed Heaters, Addenda (Z21.13.4a) to Approval Requirements Z21.13.4-1955

Gas Unit Heaters, Approval Requirements for (Revision of ASA Z21.16-1951, and Addenda Z21.16a-1953 and Z21.16b-1955)

Domestic Gas Appliance Pressure Regulators, Listing Requirements for, (Revision of ASA Z21.18-1955)

Metal Connectors for Gas Appliances, Addenda (Z21.24a) to Listing Requirements Z21.24-1955

Hotel and Restaurant Deep Fat Fryers, Addenda (Z21.27a) to Approval Requirements ASA Z21.27-1955

Portable Gas Baking and Roasting Ovens, Approval Requirements for (Revision of ASA Z21.28-1948, and Addenda Z21.28a-1954)

Gas Counter Appliances, Approval Requirements for (Revision of ASA Z21.31-1941, and Addenda Z21.31a-1954)

Gas-Fired Duct Furnaces, Addenda (Z21.34a) to ASA Z21.34-1955

Sponsor: American Gas Association

Reaffirmation Being Considered

Automatic Pilots, Listing Requirements for Z21.20-1951

Installation of Gas Equipment in Large Boilers, Requirements for, ASA Z21.33-1950

MATERIALS AND TESTING

In Standards Board

Electrodeposited Coatings of Zinc on Steel, Specifications for, ASTM A 164-55; ASA G53.1

Electrodeposited Coatings of Cadmium on Steel, Specifications for, ASTM A 165-55; ASA G53.2

Electrodeposited Coatings of Nickel and Chromium on Steel, Specifications for, ASTM A 166-55T; ASA G53.3

Electrodeposited Coatings of Nickel and Chromium on Copper and Copper-Base Alloys, Specifications for, ASTM B 141-55; ASA G53.4

Electrodeposited Coatings of Nickel and Chromium on Zinc and Zinc-Base Alloys, Specifications for, ASTM B 142-55; ASA G53.5

Chromium Plating on Steel for Engineering Use, Recommended Practice for, ASTM B 177-55; ASA G53.6

Preparation of Low-Carbon Steel for Electroplating, Recommended Practice for, ASTM B 183-49; ASA G53.7

Electrodeposited Coatings of Lead on Steel, Specifications for, ASTM B 200-55T; ASA G53.8

Chromate Finishes on Electrodeposited Zinc, Hot-Dipped Galvanized, and Zinc Die-Cast Surfaces, Specifications for, ASTM B 201-55T; ASA G53.9

Preparation of High-Carbon Steel for Electroplating, Recommended Practice for, ASTM B 242-54; ASA G53.10

Preparation of Zinc-Base Die Castings for Electroplating, Recommended Practice for, ASTM B 252-53; ASA G53.11

Preparation of and Electroplating on Aluminum Alloys, Recommended Practice for, ASTM B 253-53; ASA G53.12

Preparation of and Electroplating on Stainless Steel, Recommended Practice for, ASTM B 254-53; ASA G53.13

Preparation of Copper and Copper-Base Alloys for Electroplating, Recommended Practice for, ASTM B 281-53T; ASA G53.14

Sponsor: American Society for Testing Materials

Withdrawal Being Considered—

Zinc-Coated Iron or Steel Chain-Link Fence Fabric Galvanized After Weaving, Specifications for, ASTM A 117-33; ASA G8.5-1935

Carbon-Steel and Alloy-Ste Blooms, Billets and Slabs for Forgings, Specifications for, ASTM A 17-29; ASA G9.1-1933

Refined Iron Bars, Specifications for, ASTM A 41-36; ASA G12-1936

Alloy-Steel Bolting Material for High-Temperature Service, Specifications for, ASTM A 96-44; ASA G17.2-1944

Mild Steel Plates, Specifications for, ASTM A 10-39; ASA G20-1939

Carbon-Steel Castings Suitable for Fusion Welding for Miscellaneous Industrial Uses, Specifications for, ASTM A 215-44; ASA G51.1-1944

Chemical Analysis of Alloys of Lead, Tin, Antimony, and Copper, Methods of, ASTM B 18-36T; ASA K5-1922

Battery Assay of Copper, Method of, ASTM B 34-36T; ASA K12-1921

Sampling Coal for Analysis, Method of, ASTM D 21-40; ASA K46-1940

Test for Alkalinity or Acidity of Pigments, Method of, ASTM D 278-31; ASA K51-1941

Sponsor: American Society for Testing Materials

MECHANICAL

American Standard Published

Hexagon Head Cap Screws, Slotted Head Cap Screws, Square Head Set Screws, Slotted Headless Set Screws, B18.6.2-1956 $1.50

Sponsors: Society of Automotive Engineers; The American Society of Mechanical Engineers

American Standard Approved

Design for Fine-Pitch Worm Gearing, B6.9-1956 (Revision of AGMA 374.02; ASA B6.9-1950) *Design procedure for fine pitch worms and worm gears giving the necessary formulae to calculate their dimensions. The worms and gears covered herein are used principally to transmit motion rather than power.*

Sponsors: American Gear Manufacturers Association; The American Society of Mechanical Engineers

In Board of Review

Boiler Rivet Steel and Rivets, Specifications for, ASTM A 31-55; ASA G28.1

Carbon-Silicon Steel Plates of Intermediate Tensile Ranges for Fusion-Welded Boilers and Other Pressure Vessels, Specifications for, ASTM A 201-54T; ASA G31.1

Chromium - Manganese - Silicon (CMS) Alloy-Steel Plates for Boilers and Other Pressure Vessels, Specifications for, ASTM A 202-54T; ASA G32.1

Nickel-Steel Plates for Boilers and Other Pressure Vessels, Specifications for, ASTM A 203-54T; ASA G33.1

Molybdenum-Steel Plates for Boilers and Other Pressure Vessels, Specifications for, ASTM A 204-54T; ASA G34.1

High-Tensile Strength Carbon-Silicon Steel Plates for Boilers and Other Pressure Vessels, Specifications for, ASTM A 212-52aT; ASA G35.1

Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service, Specifications for, ASTM A 182-55T; ASA G37.1

Carbon and Alloy Steel Nuts and Bolts for High-Pressure and High-Temperature Service, Specifications for, ASTM A 194-55T; ASA G38.1

Forged or Rolled Steel Pipe Flanges, Forged Fittings, and Valves and Parts for General Service, Specifications for, ASTM A 181-55T; ASA G46.1

Sponsor: American Society for Testing Materials

Mechanical (Continued)—

In Standards Board

Life Tests for Single-Point Tools of Sintered Carbide, B5.34
Sponsors: American Society of Mechanical Engineers; American Society of Tool Engineers; Metal Cutting Tool Institute; National Machine Tool Builders' Association; Society of Automotive Engineers

Conveyor Terms and Definitions, B75
Sponsor: Conveyor Equipment Manufacturers Association

MINING

Withdrawal Being Considered

Sampling Coal for Analysis, Method of, ASTM D 21-40; ASA K46-1940
Sponsor: American Society for Testing Materials

PAINTS AND VARNISHES

American Standards Published

Raw Linseed Oil, Specifications for, ASTM D 234-55; ASA K34.1-1956 (Revision of ASTM D 234-48; ASA K34-1949) $.30
Properties and methods of testing raw linseed oil.

Boiled Linseed Oil, Specifications for, ASTM D 260-55; ASA K35.1-1956 (Revision of ASTM D 260-48; ASA K35-1949) $.30
Properties and methods of testing boiled linseed oil.

Tinting Strength of White Pigments, Method of Test for, ASTM D 332-55; ASA K56.1-1956 (Revision of ASTM D 332-36; ASA K56-1941) $.30
Apparatus, materials, procedure and calculation for determination of tinting strength of white pigments. Intended to be used only for comparing a sample of the pigment to be tested with a reference standard of the same type and grade.
Sponsor: American Society for Testing Materials

PHOTOGRAPHY

American Standards Published

Photographic Grade Sodium Citrate, Specification for, ASA PH4.179 $.25
Requirements are given for the physical and chemical properties of the indicated chemical to insure its satisfactory use for photographic processing purposes.
Sponsor: Photographic Standards Board

16mm Film Perforated Along Two Edges, Usage in Camera, PH22.9-1956 (Revision of Z22.9-1946) $.25
Gives position of the emulsion and rate of projection of 16mm film perforated along two edges for use in cameras.

16mm Film Perforated Along Two Edges, Usage in Projector, PH22.10-1956 (Revision of Z22.10-1947) $.25
Gives position of the emulsion and rate of projection of 16mm film perforated along two edges for use in projectors.

Picture Printer Aperature for Contact Printing 16mm Positive from 16mm Negative, PH22.48-1956 (Revision of Z22.48-1946) $.25
Gives dimensions for picture printer aperture for contact printing 16mm positive from 16mm negative.

Magnetic Coating of 8mm Motion-Picture Film, PH22.88-1956 $.25
Gives dimensions applicable to the magnetic coating on the side of the film toward the lamp on a projector arranged for direct projection on a reflection-type screen.

200-Mil Magnetic Sound Record on 16mm Film Base Perforated One Edge, PH22.97-1956 $.25

Magnetic Coating of 16mm Film Perforated Along Both Edges, PH22.101-1956 $.25
Gives dimensions applicable to the magnetic coating on the side of the film toward the lamp on a projector arranged for direct projection on a reflection-type screen.
Sponsor: Society of Motion Picture and Television Engineers

American Standard Approved

Determining the Actinity or the Relative Photographic Effectiveness of Illuminants, Method for, PH2.3-1956 (Revision of ASA PH2.3-1953)
Sponsor: Photographic Standards Board

PIPE AND FITTINGS

American Standards Published

Copper and Copper Alloy Forging Rod, Bar, and Shapes, Specifications for (Revision of ASTM B 124-54; ASA H7.1-1954) ASTM B124-55; ASA H7.1-1956 $.50
Requirements covering copper and copper-alloy rod, bar, and shapes capable of being hot forged by various methods.

Seamless Copper Water Tube, Specifications for, ASTM B 88-55; ASA H23.1-1956 (Revision of ASTM B 88-54; ASA H23.1-1954) $.50
Requirements covering seamless copper tube especially designed for plumbing purposes, underground water services, drainage, etc, but also suitable for copper coil water heaters, fuel oil lines, gas lines, etc.

Seamless Copper Pipe, Standard Sizes, Specification for, ASTM B 42-55; ASME SB-42; ASA H26.1-1956 [Revision of ASTM B 42-54; ASA H26.1-1954 (2nd ed.)] $.50
Requirements covering seamless copper pipe in all standard pipe sizes, both regular and extra-strong, suitable for use in plumbing, boiler feed lines, and for similar purposes.

Seamless Red Brass Pipe, Standard Sizes, Specification for, ASTM B 43-55; ASME SB-43; ASA H27.1-1956 [Revision of ASTM B 43-54; ASA H27.1-1954 (2nd ed.)] $.50
Requirements covering seamless red brass pipe in all standard pipe sizes, both regular and extra-strong, suitable for use in plumbing, boiler feed lines, and for similar purposes.
Sponsor: American Society for Testing Materials

In Board of Review

Welded and Seamless Steel Pipe, Specifications for (Revision of ASTM A 53-47; ASA B36.1-1950) ASTM A 53-55T; ASA B36.1

Welded Wrought-Iron Pipe, Specifications for (Revision of ASTM A 72-45; ASA B36.2-1950) ASTM A 72-55; ASA B36.2

Seamless Carbon-Steel Pipe for High-Temperature Service, Specifications for (Revision of ASTM A 106-48T; ASA B36.3-1950) ASTM A 106-55T; ASA B36.3

Electric-Fusion (Arc)-Welded Steel Plate Pipe, Sizes 16 in. and over, Specifications for [Revision of Electric-Fusion-Welded Steel Pipe (Sizes 30 in. and over), ASTM A 134-42; ASA B36.4-1942] ASTM A 134-54; ASA B36.4

Electric - Resistance - Welded Steel Pipe, Specifications for (Revision of ASTM A 135-46; ASA B36.5-1950) ASTM A 135-55T; ASA B36.5

Electric-Fusion (Arc)-Welded Steel Pipe (Sizes 4 in. and over) [Revision of Electric - Fusion - Welded Steel Pipe (Sizes 4 in. to but not including 30 in.) ASTM A 139-46; ASA B36.9-1950] ASTM A 139-55; ASA B36.9

Electric-Fusion-Welded Steel Pipe for High-Temperature Service (Revision of Electric-Fusion-Welded Steel Pipe for High-Temperature and High-Pressure Service, ASTM A 155-42; ASA B36.11-1942) ASTM A 155-55T; ASA B36.11

Seamless Steel Boiler Tubes, Specifications for (Revision of Lap-Welded and Seamless Steel and Lap-Welded Iron Boiler Tubes, ASTM A 83-44; ASA B36.12-1945 ASTM A 83-55T; ASA B36.12

Electric - Resistance - Welded Steel and Open-Hearth Iron Boiler Tubes, Specifications for (Revision of ASTM A 178-44; ASA B36.13-1945) ASTM A 178-55T; ASA B36.13

Seamless Steel Boiler Tubes for High-Pressure Service, Specifications for (Revision of ASTM A 192-44; ASA B36.14-1945) ASTM A 192-55T; ASA B36.14

Medium-Carbon Seamless Steel Boiler and Superheater Tubes, Specifications for (Revision of ASTM A 210-44; ASA B36.15-1945) ASTM A 210-55T; ASA B36.15

Spiral-Welded Steel or Iron Pipe, Specifications for (Revision of ASTM A 211-44; ASA B36.16-1945) ASTM A 211-54; ASA B36.16

Seamless Alloy-Steel Boiler, Superheater, and Heat Exchanger Tubes, Specifications for (Revision of Seamless Alloy-Steel Boiler and Superheater Tubes, ASTM A213-44; ASA B36.17-1945) ASTM A 213-55T; ASA B36.17

Electric - Resistance - Welded Steel Boiler and Superheater Tubes for High-Pressure Service, Specifications for (Revision of ASTM A 226-44; ASA B36.18-1945) ASTM A 226-55T; ASA B36.18

Seamless Alloy-Steel Pipe for High-Temperature Service, Specifications for (Revision of ASTM A158-49T; ASA B36.21-1950)

Seamless Carbon-Molybdenum Alloy-Steel Pipe for High-Temperature Service, Specifications for (Revision of ASTM A 206-48T; ASA B36.22-1950)

Welded and Seamless Open-Hearth Iron Pipe, Specifications for (Revision of Welded - Alloyed Open - Hearth Iron Pipe, ASTM A 253-47; ASA B36.23-1950) ASTM A 253-55T; ASA B36.23

Seamless Chromium-Molybdenum Alloy-Steel Pipe for Service at High Temperatures (Revision of ASTM A 280-48T; ASA B36.24-1950)

Seamless and Welded Austenitic Stainless Steel Pipe, Specifications for (Revision of ASTM A 312-48T; ASA B36.26-1950) ASTM A 312-55T; ASA B36.26

Seamless Low-Carbon and Carbon-Molybdenum Steel Still Tubes for Refinery Service, Specifications for, ASTM A 161-55T; ASA B36.27

Seamless Cold-Drawn Low-Carbon Steel Heat-Exchanger and Condenser Tubes, Specifications for, ASTM A 179-55T; ASA B36.28

Seamless Cold-Drawn Intermediate Alloy-Steel Heat-Exchanger and Condenser Tubes, Specifications for, ASTM A 199-55T; ASA B36.29

Seamless Intermediate Alloy-Steel Still Tubes for Refinery Service, Specifications for, ASTM A 200-55T; ASA B36.30

Seamless Carbon-Molybdenum Alloy-Steel Boiler and Superheater Tubes, Specifications for, ASTM A 209-55T; ASA B36.31

Electric - Resistance - Welded Steel Heat-Exchanger and Condenser Tubes, Specifications for, ASTM A 214-55T; ASA B36.32

Welded Austenitic Stainless Steel Boiler, Superheater, Heat Exchanger and Condenser Tubes, Specifications for, ASTM A 249-55T; ASA B36.33

Electric-Resistance-Welded Carbon-Molybdenum Alloy-Steel Boiler and Superheater Tubes, Specifications for, ASTM A 250-55T; ASA B36.34

Copper Brazed Steel Tubing, Specifications for, ASTM A 254-55T; ASA B36.35

Seamless and Welded Ferritic Stainless Steel Tubing for General Service, Specifications for, ASTM A 268-55; ASA B36.36

Seamless and Welded Austenitic Stainless Steel Tubing for General Service, Specifications for, ASTM A 269-55; ASA B36.37

Seamless and Welded Austenitic Stainless Steel Sanitary Tubing, Specifications for, ASTM A 270-55; ASA B36.38

Seamless Austenitic Chromium-Nickel Steel Still Tubes for Refinery Service, Specifications for, ASTM A 271-55; ASA B36.39

Seamless and Welded Steel Pipe for Low-Temperature Service, Specifications for, ASTM A 333-55T; ASA B36.40

Seamless and Welded Steel Tubes for Low-Temperature Service, Specifications for, ASTM A 334-55T; ASA B36.41

Seamless Ferritic Alloy-Steel Pipe for High-Temperature Service, Specifications for (Revision of Seamless 1 Percent Chromium, 0.5 Percent Molybdenum Alloy-Steel Pipe for Service at High Temperatures, ASTM A 315-48T; ASA B36.25-1950) ASTM A 335-55T; ASA B36.42

Sponsors: American Society of Mechanical Engineers; American Society for Testing Materials

TEXTILES

American Standards Published

Testing and Tolerances for Cotton Yarns, Tentative Methods of, ASTM D 180-54T; ASA L14.13-1956 (Revision of ASTM D180-52T; ASA L14.13-1953) $.30

Institutional Textiles, Minimum Performance Requirements for, ASA L24 $6.25
Sponsor: American Hotel Association

Part I: Institutional Furnishings

Awnings and Canopies	L24.1.1-1955
Decorative Bedspreads	L24.1.2-1955
Glass Fiber Window Curtains	L24.1.3-1955
Window Curtain Fabrics (Sash-casement) (Excluding Glass Fiber)	L24.1.4-1955
Woven Drapery Fabrics (Excluding Glass Fiber)	L24.1.5-1955
Woven Slip Cover Fabrics	L24.1-6-1955
Woven Upholstery Fabrics	L24.1.7-1955

Part II: Utility Textiles

Bath Mats	L24.2.1-1955
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Table Napery (Damask Type)	L24.2.7-1955
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Woven Blankets	L24.2.9-1955
Woven Shower Curtains	L24.2.10-1955
Table Napery (Other than Damask-White or Dyed)	L24.2.11-1955
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Part III: Uniforms

Tailored Uniforms Intermediate (Year Round Suiting)	L24.3.1-1955
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Tailored Uniforms Light Weight (Tropical Suiting)	L24.3.3-1955
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All Cotton and Linen Washable Uniforms for Men and Women (Heavy Duty)	L24.3.6-1955
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Woven Uniform Fabrics—Women's and Girls' (Rayon and Acetate)	L22.1.4-1952
Woven Lining Fabrics—Women's and Girls' (Rayon and Acetate)	L22.1.6-1952
Woven Liniag Fabrics—Men's and Boys' (Rayon and Acetate)	L22.2.7-1952

Part IV: Work Clothes

Aprons, Machinists or Toolmakers (Loom Finished)	L24.4.1-1955
Coveralls, Shop Coats, Overalls, Work Pants, and Dungarees, (Light Duty), Stock, Indigo, or Yarn Dyed	L24.4.2-1955
Coveralls, Shop Coats, Overalls, Work Pants, and Dungarees, (Heavy Duty), Stock, Indigo, or Yarn Dyed	L24.4.3-1955
Coveralls, Shop Coats, Overalls, and Dungarees (Light Duty)	L24.4.4-1955
Coveralls, Shop Coats, Overalls, and Dungarees (Heavy Duty)	L24.4.5-1955
Work Shirts (Light Duty)	L24.4.6-1955
Work Shirts (Light Duty), Stock, Indigo, or Yarn Dyed	L24.4.7-1955
Work Shirts (Heavy Duty)	L24.4.8-1955
Work Shirts (Heavy Duty), Stock, Indigo, or Yarn Dyed	L24.4.9-1955
Work Pants (Light Duty)	L24.4.10-1955
Work Pants (Heavy Duty)	L24.4.11-1955
Proposed Procedure for Labeling, Tags and Certification	L24.5.1-1955

Also Includes:

Part V: Test Methods to be Used with the L24 Standards

In Standards Board

Textile Safety Code (Revision of ASA L1.1-1947)
Sponsor: National Safety Council

WHAT'S NEW ON AMERICAN STANDARDS PROJECTS

Coordination of Dimensions of Building Materials and Equipment, A62—

Sponsors: American Institute of Architects; Associated General Contractors of America; National Association of Home Builders; The Producers' Council.

A study committee on integrated ceilings is to be set up following action taken by Sectional Committee A62 at its meeting May 8. This action followed an exploratory meeting in March that was enthusiastic about the possibility of developing modular integrated ceilings, including assemblies of lighting troffers, acoustic tiles, etc.

A step toward bringing about greater coordination of window sizes using the 4-inch module was taken at a meeting of members of the National Association of Home Builders and the Producers' Council, May 17. Purpose of the meeting was to determine practical standards for dimensioning windows and window openings. Windows are now manufactured in a multiplicity of sizes, some firms producing windows in as many as 350 different sizes. Representatives of the Aluminum Window Manufacturers Association, the National Woodwork Manufacturers Association, and the Steel Window Institute also took part in the May 17 meeting. The conferees agreed that dimensional standardization is desirable and could eventually lead to lower window costs.

NAHB's Research Institute is being asked to determine which win-

dow sizes are generally preferred by builders. This information will then be made available to window manufacturers for study. At the next meeting it is planned to present acceptable standards for dimensioning windows and openings.

Dimensional Standardization of Bolts, Nuts, Rivets, Screws, and Similar Fasteners, B18—

Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

The American Standard, Slotted and Recessed Head Screws, Machine, Cap, Wood, Tapping, and Slotted Headless Types, B18.6-1947, is now under revision. Because new material to be included is so extensive, the revised edition is being issued in four sections:

- Slotted and Recessed Head Wood Screws, B18.6.1
- Hexagon Head Cap Screws, Slotted Head Cap Screws, Square Head Set Screws, Slotted Headless Set Screws, B18.6.2
- Slotted and Recessed Machine Screws, B18.6.3
- Slotted and Recessed Head Tapping Screws and Metallic Drive Screws, B18.6.4

Two of these sections have now been approved. American Standard B18.6.1-1956, on Slotted and Recessed Head Wood Screws has been published and is now available. American Standard B18.6.2-1956, on Hexagon Head Cap Screws, Slotted Head Cap Screws, Square Head Set Screws, Slotted Headless Set Screws, has been approved and copies will be available soon.

Until the other two sections are completed and approved, insofar as it covers the same material, the 1947 edition, American Standard B18.6-1947, remains in effect.

Photographic Films, Plates, and Papers, PH1—

Sponsor: Photographic Standards Board

New officers were elected recently by Sectional Committee PH1. Victor J. Moyes, Technical Coordinator to the Sales Service Division and Curator of the Patent Department Museum, Eastman Kodak Company, Rochester, N. Y., is chairman of the committee. C. H. Jordan, president of Kilborn Photo Paper Company and president of Jordan Building Corporation, is vice-chairman.

Mr Moyes has been active in work on photographic standards for many years. He was a member of the former Z38 Sectional Committee's Subcommittee 1 on Dimensions of Sensitized Materials. For several years he served on Subcommittee 8 on Processing Equipment. Until recently Mr Moyes was chairman of the Subcommittee on Microtransparencies of Sectional Committee PH5.

Mr Moyes has been with Kodak since 1925, immediately after receiving an SM degree in chemical engineering from Massachusetts Institute of Technology. Originally connected with the Development Department on apparatus and camera, he has been in his present position since 1945. His hobby, he says, is Boy Scouts, and he and his wife garden for their own amusement.

Mr Jordan has been with the Kilborn Photo Paper Company for 11 years, serving first as vice-president and sales manager and then as vice-president and general manager before becoming president. He is also president of the Iowa Golf Association and president of the Cedar Rapids Community Chest.

Victor J. Moyes

C. H. Jordan

Maurice G. Anderson

Photographic Sensitometry, PH2

Sponsor: Photographic Standards Board

New officers have been elected by Sectional Committee PH2. Maurice G. Anderson, Manager, General Quality Control Department, Ansco, is chairman. J. P. Weiss, E. I. duPont de Nemours & Company, is vice-chairman; and Earl R. Clark, Eastman Kodak Company, Rochester, New York, is secretary.

Mr Anderson has long been associated with the manufacture and testing of sensitized photographic materials, and has taken an active part in the work of committee PH2. He served as vice-chairman of the committee from 1952 until his election this year as chairman; and in

addition has been chairman of several subcommittees. Work done by these subcommittees includes sensitometry and grading of photographic papers, and development of the American Standard Photographic Exposure Computer. Currently Mr Anderson is chairman of Subcommittees PH2-8, Film Speeds at Short Exposure Times, and PH2-13, Exposure Indexes for Tungsten and Other Sources.

Mr Anderson is a member of the American Society for Quality Control. He takes an active interest in local activities, and at present is serving as chairman of the Binghamton Technical Section of the Photographic Society of America. He is a member and is past president of the Southern Tier Technical Society, and a member of the Binghamton Camera Club.

Photographic Apparatus, PH3—

Sponsor: Photographic Standards Board

A major development in photography was begun at a meeting May 4 when 21 representatives of manufacturers and consumers voted to begin immediate standardization of electronic flash equipment.

Eight working committees were appointed to study definitions and methods of measuring various factors to be included in the standards.

Harry L. Parker, president, American Speedlight Corporation, Middle Village, N. Y., is chairman of PH3's Task Force on Electronic Flash Standards. Following the meeting he said, "I believe that the work of this committee will help widespread understanding of this important new photographic tool and will clear up much of the mystery and confusion that has shrouded it."

The eight working committees cover: (1) Strength of light and coverage of reflector; (2) Duration of flash; (3) Recharge time; (4) Safety factors; (5) Photographic effectiveness; (6) Nomenclature or standard terms for electronic flash; (7) Photographic quality of electronic flash; (8) Economical factors.

Standards Outlook

by LEO B MOORE

Standards Information

Many folks shy away from publicity of any kind, preferring to have their true merits and real accomplishments discovered, as it were. This is very apt to be true of dedicated individuals who feel that the job done is credit enough. Standards engineers seem to fall largely into this class and are understandably reluctant to seek the limelight with its clamor and scrutiny. However, there are many newsworthy events and actions whose treatment could not be considered publicity-seeking by anyone.

Included in this category is some vital information that we have a legitimate right, and to some degree a responsibility, to see that others know. The following ideas should be considered only a starter for a long list of similar activities.

One company has prepared a sheet with the names of all its standards engineers, together with their pictures and pertinent information about them. These sheets are distributed around the company. From them, we learn the areas of interest of these men but, better still, we can link the name and the face for future reference.

In another company, the standards engineer has used the idea of a questionnaire to inquire about a standard at the time of its review. The questionnaire clearly indicates this standard as his concern, and provides others with this information. These are two simple and effective devices for letting other people know who is who and what is of interest to each.

Here are some ways for letting the organization know what we are doing.

The regular publication of the standards project list, with some brief sentences stating the aim of each project, serves as notice of our program.

For finished projects, there are many ways of publishing the facts. Recently, in the company newspaper of a leading utility there was a short story of the simplification of files, accompanied by pictures of the "before" and "after," showing the reduction from 41 to 7. This could easily have served as the basis for a short article on standardization. Another treatment of this type of information is a display board where the actual items may be seen and a short story of what was done may be read. More elaborate, cabinets displaying selected standard items might be available so that design engineers may see and feel the articles they may be considering.

Accounts of visits to other companies, and of sessions at ASA and SES meetings, may form the basis for conveying information to others. Visits to your own organization by others provide a chance to have these folks talk with people in your company.

The opportunities are endless and their recognition only a question of imagination. The idea is to let others know what they should know and what they have a right to know.

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Mr Moore is Assistant Professor of Industrial Management at Massachusetts Institute of Technology where he teaches a full-term course in industrial standardization.

Need Information on Fine-Pitch Gears?

1956 data on dimensions, pitch, thickness, depth, clearance, backlash, and many other important points now available in these revised American Standards—

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Revises requirements to keep up to date with current practice. Adopts format for putting gear dimensions on drawings consistent with AGMA and American Standard gear nomenclature.

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Adopts non-throated, simplified gear blank suited to worm gears of fine pitch. Includes separate section on blanks.

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Puts into effect recent advances in instrumentation for gear inspection. Includes new tables of settings for variable center distance gage.

Also available—Fine-Pitch Straight Bevel Gears, AGMA 206.03; American Standard B6.8-1950 $1.00

For American Standards on other types of gears, see page 27 (Project B6) of current list of American Standards

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Sponsors: American Gear Manufacturers Association; American Society of Mechanical Engineers